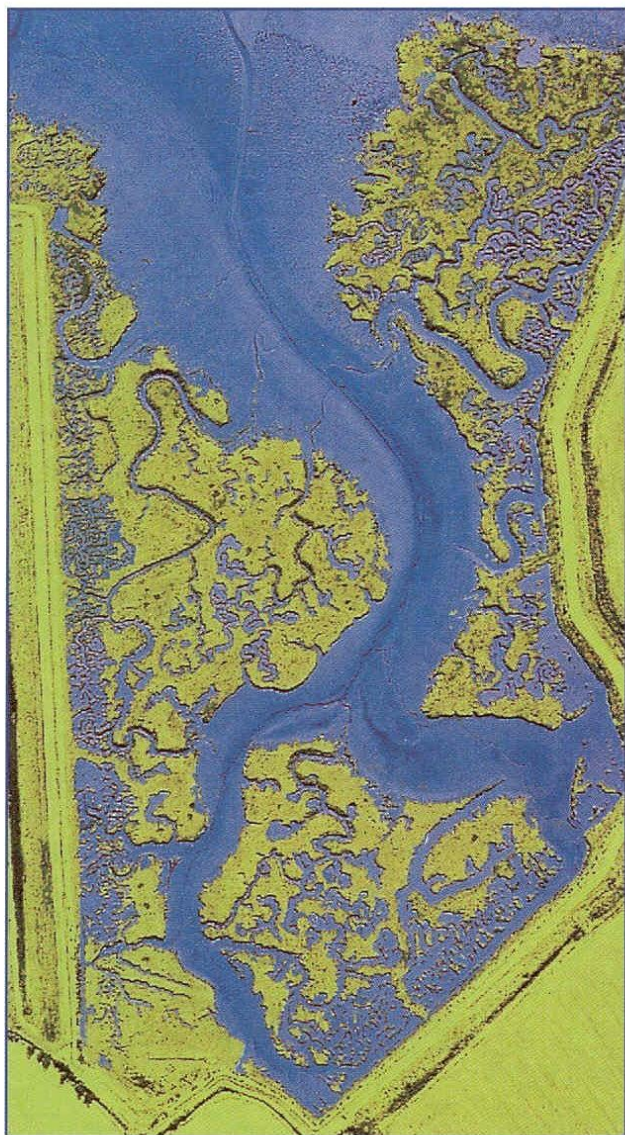


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**Humber Estuary High Tide Roost Review
2013-2014**

Final Report

Report to the RSPB & Natural England

Institute of Estuarine and Coastal Studies
University of Hull

12th September 2016

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EXECUTIVE SUMMARY

Approach

The project was initiated by the Royal Society for the Protection of Birds (RSPB) with Natural England joining as a co-funder, the project aims being to provide an update of the original Humber Estuary High Tide Roost Review study from the mid-2000s.

The project was split into phases with Phase 1 updating the WeBS core count (high water) data (data provided by Natural England/RSPB) in order to identify the current status of usage by key bird species in the Humber, any changes to the population that may have occurred between the two roost analysis periods and to provide a basis for any subsequent assessment of roost change as part of the subsequent consultation phase.

A consultation phase (Phase 2) with key data collectors e.g. WeBS counters and other surveyors was then undertaken with a request for information on roost usage along their count sector, and any adjacent area. Once a suitable period of time had elapsed for returns (several months), the information was collated and a follow-up data sourcing phase undertaken by the RSPB with contact made with key surveyors, and these data were then provided for integration with the counter returns.

The data from Phases 1 and 2 were then analysed and transferred to the GIS in the form of a series of annotated maps (polygons) with associated data files (Phase 3). These were analysed to extract key roost use information on a spatial and species basis. Where data are absent or equivocal, additional information sources have been used e.g. from Environmental Statements, Technical Reports etc.

Reporting was undertaken as the final phase, including the provision of a draft for external review and comment.

Findings

Outer Humber (North Bank). The upper shore and adjacent terrestrial habitats of Spurn Bight were identified as providing important roosts for a number of species e.g. Kilnsea Wetlands and Easington Lagoons for a range of wader species, with fields around Kilnsea also used by Brent Geese and waders. Importantly, an interchange of birds between the Spurn Bight and Lincolnshire frontage was also recorded, primarily on larger spring tides. A series of fields between Welwick and Humber Side Lane were also noted as being used as a roost by Brent Geese, as well as waders, including up to 4,500 Golden Plover on large spring tides. The Welwick marsh and nearshore was noted as a roost, but with movement off on large tides into the realignment site.

Middle Humber. Responses identified a number of fields behind the north bank flood defences between Hawkins Point and Saltend as supporting important roosts of waders, with some utilisation of the upper shore of Cherry Cobb Sands on small tides. Fields adjacent to the estuary on the south bank of the Middle Humber were also noted as roosts e.g. to the east of Barton upon Humber and around Skitterness and East Halton Skitter, including regionally and occasionally nationally important flocks of Golden Plover, Lapwing and Curlew. Additional data identified the area around North Killingholme Haven to Immingham as regionally important for some waders. A number of the fields within the

South Humber Gateway similarly support wader flocks, including Golden Plover, Lapwing, Curlew and Ruff.

Inner Humber. The Welton Waters complex was identified as a roost resource for waders such as Golden Plover and Lapwing, with further utilisation of fields to the west of Brough. The saltmarsh frontage on Broomfleet Island was noted as being used by ducks including Shelduck and Wigeon, with additional use on the Whitton Sand by these species, as well as waders such as Golden Plover and Lapwing. The Blacktoft Sands site was also used by Golden Plover and other waders, with use further up the River Ouse at Howdendyke by Golden Plover. The Alkborough managed realignment site was noted as supporting a varied roost population including large roost flocks of Golden Plover and Lapwing, and with a large foraging population of ducks and waders also using the site as a potential roost. The Alkborough escarpment was noted for Curlew use, with fields around Whitton also utilised by the species together with flocks of Golden Plover, Lapwing and Dunlin.

Outer Humber (South Bank). The Cleethorpes frontage was recorded as being used by Golden Plover, Knot and Dunlin, with the Tetney basin to the south also used by Knot together with Grey Plover, Bar-tailed Godwit and Dunlin on spring tides. Inland fields extending south from here are utilised by Golden Plover and Lapwing as well as Brent Geese, with the intertidal high shore around Horse Shoe Point used by a number of wader species including Sanderling and Ringed Plover on passage. Large spring tides push some of these birds onto adjacent marsh and inland fields.

Outer Humber (Coastal). The Grainthorpe Haven to Donna Nook reach was recorded as being used by large flocks of Golden Plover, Lapwing and Knot, together with Brent Geese and Shelduck. Between Donna Nook and Saltfleet the midshore can support a mixed wader roost assemblage with Oystercatcher, Dunlin, Knot and Ringed Plover most numerous. Wildfowl including Brent Geese and Shelduck also use the area, with tidal inundation pushing flocks up shore. Saltmarsh adjacent to Saltfleet Haven is used by duck such as Teal and Wigeon and waders including Knot, Curlew and Snipe.

Discussion

Consultation Response. The consultation exercise produced a reasonable WeBS counter response, and in conjunction with information from other professional counters and a range of grey and published literature sources, it is considered that a reasonable coverage has been achieved, within the limitations of a study of this type.

Change in Use. Consultee responses were very restricted in terms of a temporal comparison of utilisation between the initial review and this document. It is also important to emphasise that an absence of data for an area does not necessarily mean that the area is not utilised as a roost. The paucity of specific comment on change over time as well as uncertainty as to whether an absence of comment for an area relates to an actual absence of use has therefore meant that little comparison of utilisation over time can be made. However, a number of sites continue to be used between surveys, including areas around Spurn Bight and in the Inner Humber. Where a decline in use was identified, this largely appears to have been ascribed to a change in habitat either through encroachment by saltmarsh, land drainage or change to agricultural practice.

Disturbance. A number of respondents identified disturbance stimuli as an issue for roost provision, primarily with disturbance sources along public rights of way, although the number of responses and associated information does not allow for a detailed disturbance cause and mitigation assessment.

Habitat Enhancement. Some consultee comments also included aspects of habitat management success. The managed realignment sites at Kilnsea Wetlands and Paull Holme Strays were identified by consultees as providing suitable roost habitat (in addition to foraging function) for a range of waders including Golden Plover, Grey Plover, Knot and Curlew.

Conclusions

It is emphasised that the data derived from the consultation process do not allow for any robust identification of areas that are **not** used as a roost resource. Such a detailed examination of habitat function for key species within and adjacent to the estuary is outwith the basic data collection remit for the WeBS core count process.

The consultation process has however provided useful information on the current status of waterbird roost utilisation for sites around the Humber Estuary, with additional grey literature and other information sources adding to this snapshot of utilisation.

The responses indicate that as with the initial review, the whole estuary provides roost site function and that patterns of use of these are complex in that they are affected by factors such as tide height and weather, as well as season and land use.

Intertidal mud and sandflats provide valuable roost function, particularly on neap tides and saltmarsh is also of value on all but large spring tides.

Flood protection banks and other man-made structures also provide roost potential however the fields adjacent to the estuary are perhaps of greatest roost value for a number of species. The fields immediately behind the flood protection banks can be used by wildfowl and waders but the most frequent and numerous utilisation tends to be by Golden Plover and Lapwing, which can be present in flocks well in excess of 1,000 individuals. These species can habitually use a field as a roost/loaf site and flocks are often present in regionally and even nationally and internationally important numbers. This utilisation can extend some distance inland (sometimes several kilometres from the estuary) and such roosts can be susceptible to disturbance, both from predator incursion and anthropogenic activity. However, other factors can influence such roost utilisation, including proximity and availability of inland foraging areas and *in situ* crop type and height.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	I
TABLE OF CONTENTS	IV
LIST OF TABLES	VI
LIST OF MAPS	VII
1. CONTEXT & METHODOLOGY	1
1.1 Context	1
1.2 Methodology	1
2. ROOST UTILISATION	3
2.1 Outer Humber (North Bank)	4
2.1.1 Area Context	4
2.1.2 Roost Review Findings	4
2.1.3 Additional Information	5
2.2 Middle Humber	14
2.2.1 Area Context	14
2.2.2 Roost Review Findings	14
2.2.3 Additional Information	16
2.3 Inner Humber & Tidal Tributaries	24
2.3.1 Area Context	24
2.3.2 Roost Review Analysis	24
2.3.3 Additional Information	25
2.4 Outer Humber (South Bank)	33
2.4.1 Area Context	33
2.4.2 Roost Review Findings	33
2.4.3 Additional Information	34
2.5 Outer Humber (Coastal)	39
2.5.1 Area Context	39
2.5.2 Roost Review Findings	39
2.5.3 Additional Information	39
4. DISCUSSION	46
4.1 Data and Coverage	46
4.2 Change in Patterns or Levels of Use	46
4.3 Disturbance	47
4.4 Habitat Enhancement	47
5. CONCLUSIONS	49
5.1 Methodology	49
5.2 Important Roost Areas	49
5.3 Future Roost Review	49

6. REFERENCES.....	51
ANNEX 1: WATERBIRD STATUS CHANGES.....	53
A1.1 Waterbird Community	54
A1.2 Pink-footed Goose	56
A1.3 Greylag Goose	57
A1.4 Canada Goose	58
A1.5 Barnacle Goose.....	59
A1.6 Brent Goose	60
A1.7 Shelduck.....	61
A1.8 Wigeon	62
A1.9 Mallard.....	63
A1.10 Avocet	64
A1.11 Oystercatcher	65
A1.12 Golden Plover	66
A1.13 Grey Plover.....	67
A1.14 Lapwing	68
A1.15 Ringed Plover	69
A1.16 Curlew	70
A1.17 Black-tailed Godwit	71
A1.18 Bar-tailed Godwit	72
A1.19 Turnstone	73
A1.20 Knot.....	74
A1.21 Ruff.....	75
A1.22 Sanderling	76
A1.23 Dunlin	77
A1.24 Redshank	78
ANNEX 2: INFORMATION REQUEST PROVIDED TO WEBS COUNTERS AND OTHER CONTRIBUTORS	79

LIST OF TABLES

Table 1: Consultee Target Notes for Map 1 Outer Estuary (North Bank)	9
Table 2: Consultee Movement Notes for Map 1 Outer Estuary (North Bank).....	12
Table 3: Consultee Target Notes for Map 2 Middle Estuary	19
Table 4: Consultee Movement Notes for Map 2 Middle Estuary	23
Table 5: Consultee Target Notes for Map 3 Inner Estuary.....	28
Table 6: Consultee Movement Notes for Map 3 Inner Estuary	32
Table 7: Consultee Target Notes for Map 4 Outer Estuary (South Bank)	37
Table 8: Consultee Movement Notes for Map 4 Outer Estuary (South Bank)	38
Table 9: Consultee Target Notes for Map 5 Outer Estuary (Coastal).....	42
Table 10: Consultee Movement Notes for Map 5 Outer Estuary (Coastal)	45

LIST OF MAPS

Map 1: Outer (North Bank) Estuary Roost Information	6
Map 1a: Outer (North Bank) Estuary Roost Information. Enlarged Kilnsea Area	7
Map 1b: Outer (North Bank) Estuary Roost Information. Enlarged Welwick Area	8
Map 2: Middle Estuary Roost Information.....	18
Map 3: Inner Estuary Roost Information	27
Map 4: Outer Estuary (South Bank) Roost Information.....	35
Map 4a: Outer Estuary (South Bank) Roost Information. Enlarged Tetney to Grainthorpe Area	36
Map 5: Outer Estuary (Coastal) Roost Information	40
Map 5a: Outer Estuary (Coastal) Roost Information. Enlarged Saltfleetby to Theddlethorpe Area	41

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1. CONTEXT & METHODOLOGY

1.1 Context

The project was initiated by the Royal Society for the Protection of Birds (RSPB) in order to provide an update of the original Humber Estuary High Tide Roost Review study, which was undertaken on behalf of Natural England (then English Nature) in the mid-2000s.

Although initiated by the RSPB as a basic review of more recent data for the estuary, Natural England also became involved in the project, with joint funding allowing for a greater scope of coverage and analysis.

1.2 Methodology

The work for the review update was split into a series of phased tasks identified by the RSPB and Natural England as the clients. The task phases undertaken for the project were as follows:

Phase 1) Update of the WeBS core count (high water) data (data provided by Natural England/RSPB). This component was considered critical in identifying the current status of usage by key species in the Humber, and any changes to the population that may have occurred between the two roost analysis periods. In particular, these data are considered of value in prompting key data collectors to consider potential causal factors in roost usage change (abundance and/or spatial extent), for example, the reduction in use of roost site over the analysis period may at least potentially be shown not to be an artefact of reduced status or species in the WeBS sector, or wider estuarine area, if use of the associated WeBS areas has remained stable. Similarly, a potential shift in roost use around the estuary by a species may also be reflected in a change in status of the species on the associated WeBS areas.

This phase required the collation of the WeBS core count data for the 5 year mean annual maxima 2007 to 2012 for the Humber Estuary. Data were initially collated using an Excel spreadsheet based on key species (29 waterbird species and a metric for total assemblage) and WeBS sectors. In addition, WeBS core count data from the baseline roost review period (1999 to 2004, 5 year mean annual maxima) were treated in a similar manner, and added to the dataset.

In order to maximise the information value from the consultation exercise (see below), one of the aims of the process was for the WeBS counters to consider and identify any changes in patterns of roost use since the previous High Tide Roost Review c. 10 years previously.

To this end, basic statistical analysis of the data was undertaken to generate information on net change in abundance between the two analysis periods for the key species and WeBS sectors, using a series of change thresholds. These thresholds were then ascribed colours and a series of maps for the Humber were subsequently generated using the change status metrics for key species and the assemblage as a whole, on a WeBS core count sector basis.

These maps were then provided as part of the consultation package sent to the WeBS counters to help stimulate thought and comment. They have been appended to this document (Appendix 1), as they also provide a useful indication of trends in waterbird usage

for the WeBS sectors of the Humber which can be cross referenced to any notable changes in usage described in text.

Phase 2) Consultation with key data collectors e.g. WeBS counters and other surveyors on current roost usage in upper shore and inland areas. All WeBS counters were mailed a request for information on roost usage along their count sector, and any adjacent area. Within the mailing was a description of the project and reasons for the request for information, together with a map showing the information provided in the first roost review, a set of the usage change maps completed under Phase 1 (on a CD-ROM) and a series of maps for annotated input by each counter. A prepaid return envelope was also provided. A copy of the counter request information is provided as an appendix to this document (Appendix 2).

A further mailshot was undertaken after a period of time to remind counters of the project and to maximise the potential for the return on information.

Once a suitable period of time had elapsed for returns (several months), the information was collated and a follow-up data sourcing phase undertaken by the RSPB with contact made with key surveyors, and these data were then provided for integration with the counter returns.

Phase 3) The data from Phases 1 and 2 were subsequently analysed and transferred to the GIS in the form of a series of annotated maps (polygons) with associated data files. These were then analysed to extract key roost use information on a spatial and species basis, together with any relevant information on changes in roost use patterns across the estuary.

Where data are absent or equivocal, additional information sources have been used, e.g. from Environmental Statements, Technical Reports etc. However, it should be noted that this study does not attempt to be a fully comprehensive cataloguing of all relevant datasets, but attempts have been made to signpost key references where possible.

Phase 4) Reporting and mapping of the findings from the above Phases.

2. ROOST UTILISATION

The text content of this report regarding roost utilisation on the Humber Estuary is based primarily on the returns from the WeBS counter and professional surveyor consultation exercise undertaken as Phase 2 of the project. Analysis of additional published and grey literature to 'gap fill' and clarify/reinforce information from the consultation exercise has also been undertaken and incorporated in the text where applicable.

The following section divides the estuary into a series of areas and examines the information regarding key areas of roost (and other) use, together with any important movements, provided during the consultation process.

The notes on site usage by waterbird species provided from the consultation responses are shown on the following maps as a series of areas delineated by a blue boundary and with an associated Target Note (TN) number for reference. Each of the TNs are summarised in the associated Target Note table and information from these and other sources are interpreted and discussed in text¹. Additional information has also been used in the roost identification process where applicable e.g. from survey reports and Environmental Statements. Where these data are considered important to clarify use of a specific site, or provide a signpost to additional, more detailed datasets, then these are identified on the maps as an Additional Information Note (AN), and numbered alphabetically. These locations are cross-referenced to the associated Target Note table.

Movements by species identified from the consultation are also mapped (in green) again with a Movement Note attached which is summarised in the associated Movement Note table, and where these are complex, an expanded map of movements is inset within the main map.

The focus of the report is on high tide roosting; however, where information has been provided on other high tide uses (i.e. foraging or loafing) then this has also been included for completeness.

It is important to emphasise that the absence of recorded usage in a given area should not be interpreted as evidence of actual absence of usage. This is particularly important for a study of this nature, which relies on information obtained via consultation and is therefore subject to the associated methodological limitations.

¹ The Target Note tables utilise standard BTO two letter species codes. These individual species codes together with the full species names can be found at <http://www.bto.org/about-birds/birdfacts/british-list>

2.1 Outer Humber (North Bank)

2.1.1 AREA CONTEXT

The extensive intertidal area of Spurn Bight can support a large number and range of waterbird species, with foraging and loafing dispersed across the area around low water. The area is largely backed by man-made flood defences, although with some areas of fronting saltmarsh and the natural sand spit of Spurn Head also present.

The largest area of saltmarsh within the Bight is located at the Welwick embayment, with a managed realignment area immediately to the west of this. The immediate hinterland is primarily comprised of low-lying arable land under a mix of crop types and rotation. Large areas of upper shore mud remain exposed on neap tides, and only on large springs is the majority of saltmarsh inundated.

To the west (upstream) from Welwick the intertidal mud and sand flat decreases in width to Hawkins Point, where only a relatively narrow fronting intertidal zone is present.

2.1.2 ROOST REVIEW FINDINGS

Map 1 and Tables 1 & 2 summarise the roost information provided from the consultation process. The target notes e.g. TNs 146-152 (Table 1) indicate that both the estuarine and seaward upper shores of Spurn peninsula are used by a range of wader species including Knot (*Calidris canutus*), Oystercatcher (*Haematopus ostralegus*), Dunlin (*C. alpina*), Sanderling (*C. alba*), Bar-tailed Godwit (*Limosa lapponica*), Ringed Plover (*Charadrius hiaticula*), Grey Plover (*Pluvialis squatarola*) and Redshank (*Tringa totanus*). Roost movements are quite complex in this area, with both along-estuary flights and longer distance movements across the estuary identified (Map1 & Table 2).

Maps 1a and 1b provide enlarged views of the more complex areas of usage (Map 1a covering Kilnsea area and Map 1b the Welwick complex).

It is of note that the newly created Kilnsea Wetlands have been identified as supporting both roosting and foraging habitat (Map 1 & 1a), with the area routinely utilised by Golden Plover (*P. apricaria*), Grey Plover, Dunlin, Knot, Redshank, Curlew (*Numenius arquata*), Greenshank (*T. nebularia*) and Bar-tailed Godwit, and with Oystercatcher using the area in winter only (TN 140 & 141). The WeBS counter consultation also identified other fields around Kilnsea as being utilised by waterbirds, both as a roost area and for foraging and loafing e.g. by Brent Geese (*Branta bernicla*), Curlew, Redshank and Golden Plover (TN 139).

The beach around the Easington Lagoons and adjacent seaward shore were identified as supporting c. 200 roosting Sanderling and over 70 Ringed Plover (TN 144). The Lagoons themselves remain a very important roost area, mostly during the summer and autumn with high numbers of Knot, Dunlin, Grey Plover and Bar-tailed godwit recorded.

A series of fields within c. 1km of the flood defences (between Welwick and Humber Side Lane) were also identified as being used as a roost resource by waterbirds using Spurn Bight (TNs 98-100; Map 1). Species using these fields included Brent Geese, Oystercatcher, Dunlin, Curlew and Redshank in relatively low number, but with up to 4,500 Golden Plover on large spring tides (TN 99). Use of these fields was described as variable

depending on crop type and water-logging, with movement often observed between these sites around high water, with a movement of birds between fields in an easterly direction towards the Long Bank/Kilnsea Wetlands area (MNs M17-M21) (Map 1 & Table 2).

Whilst no specific target notes were provided for Spurn Peninsula, it was noted by a respondent that since the 'breach' of the peninsula there have been increasing numbers of waders (Dunlin & Knot) roosting on both the northern and southern sides of the breach area, whilst a reduction in recreational disturbance to roost sites on the peninsula was also noted.

The upper shore intertidal area around Skeffling Clough (TN 96) was also noted as being used by c. 100 Oystercatcher and 50 Redshank.

On neap tides (less than 5.6m Grimsby (datum not supplied)), the upper shore intertidal area (TN 101) is used around high water as a roost/loaf site by the assemblage using the general fronting area, this having been historically identified as a neap roost (e.g. Tasker & Milson, 1979).

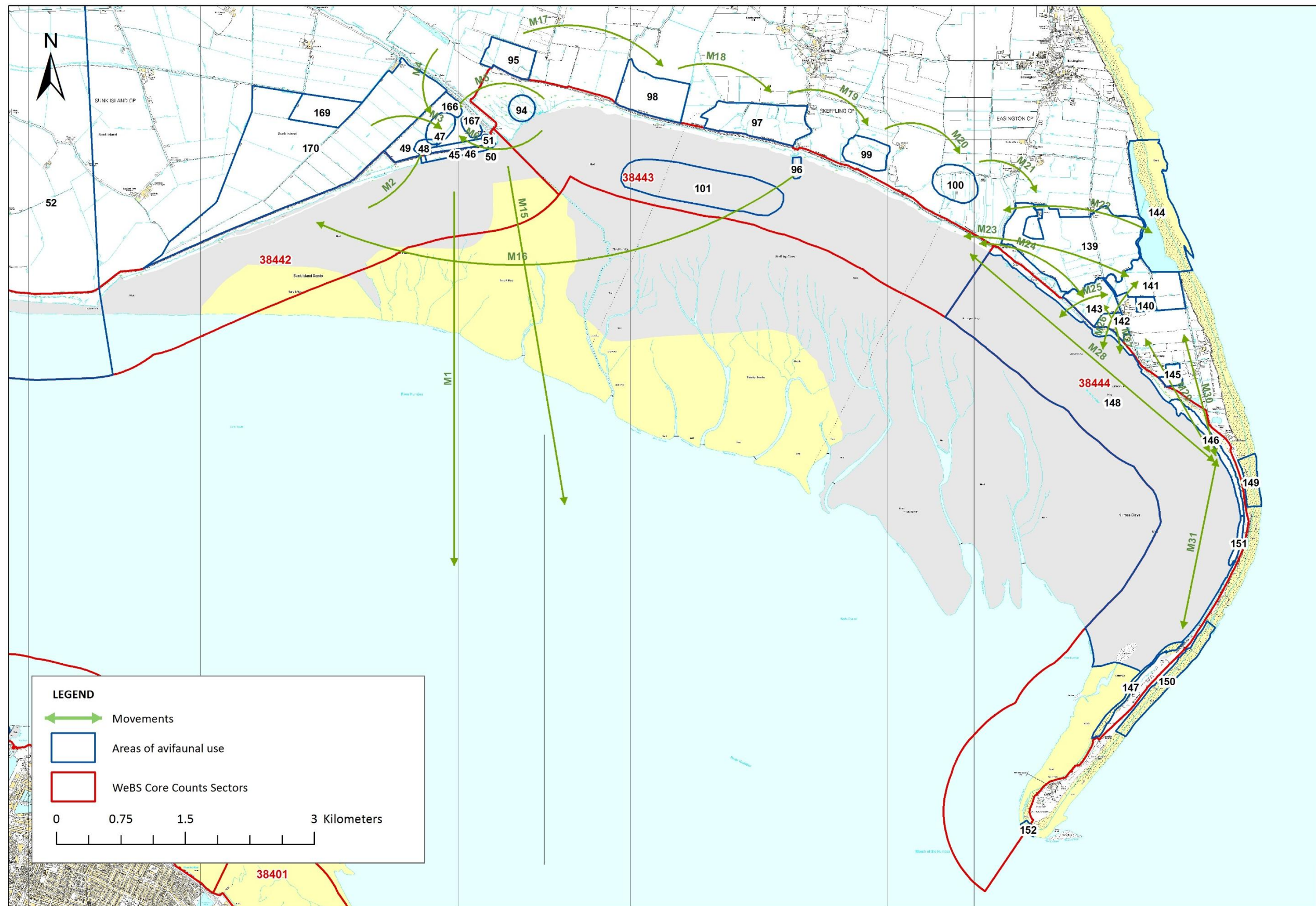
The extensive fronting saltmarsh at Welwick was identified as supporting the assemblage using the fronting intertidal mudflats across all tide heights to springs. However, on higher springs (7.7m (Grimsby) datum not supplied), birds are pushed off the area and are reported as moving in a westerly direction onto the Welwick realignment site (MNs M5 & M6) (Map 1 & Table 2).

A detailed account of how waterbirds utilise the Welwick realignment site and environs was provided from the consultation, this described in a series of TNs on Map 1, on the enlarged Map 1b (TNs 45-51; 94-95; 166-170) and in notes given in Tables 1 & 2. The area, which was first inundated in 2006, is certainly used by a number of species, with movement into the site from adjacent intertidal and marsh areas, as well as from fields in the area. Species using the area include Brent Geese, Shelduck (*Tadorna tadorna*), Grey Plover, Golden Plover, Lapwing (*Vanellus vanellus*), Knot, Dunlin, Black-tailed Godwit (*L. limosa*), Bar-tailed Godwit, Curlew and Redshank, with species usage levels depending on the level of tidal inundation.

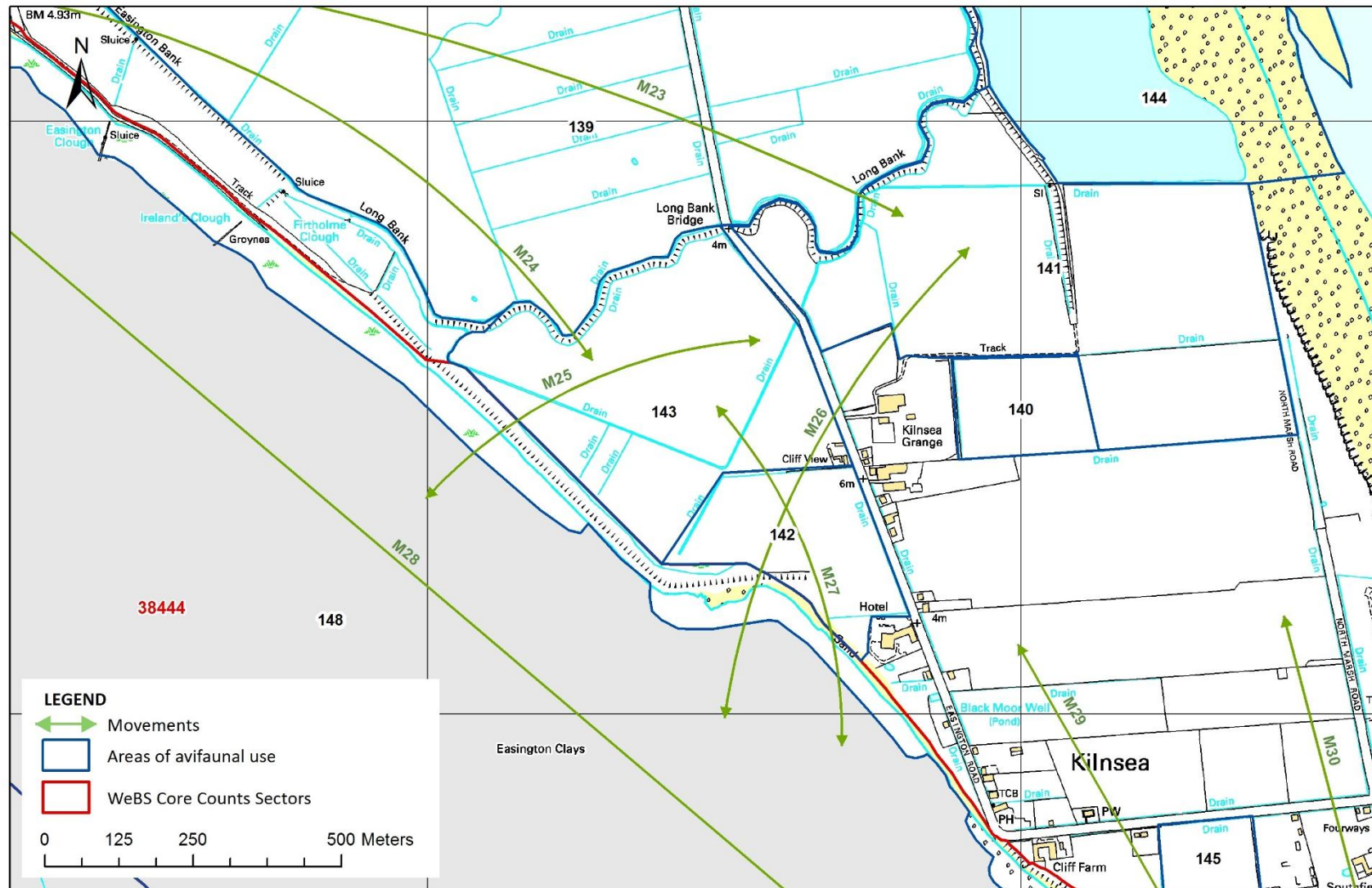
In addition to the realignment site and adjacent fields, the flood protection bank fronting the realignment site was also identified as being used by Oystercatcher, Bar-tailed Godwit, Curlew, Redshank and Turnstone (*Arenaria interpres*), particularly around high water (TN 45). However, depending on the level of use and the height of the tide, there can be movements around the Welwick realignment area (MNs M2-M6), as well as across the estuary (MNs M1 & M15) (Maps 1 & 1b & Table 2).

2.1.3 ADDITIONAL INFORMATION

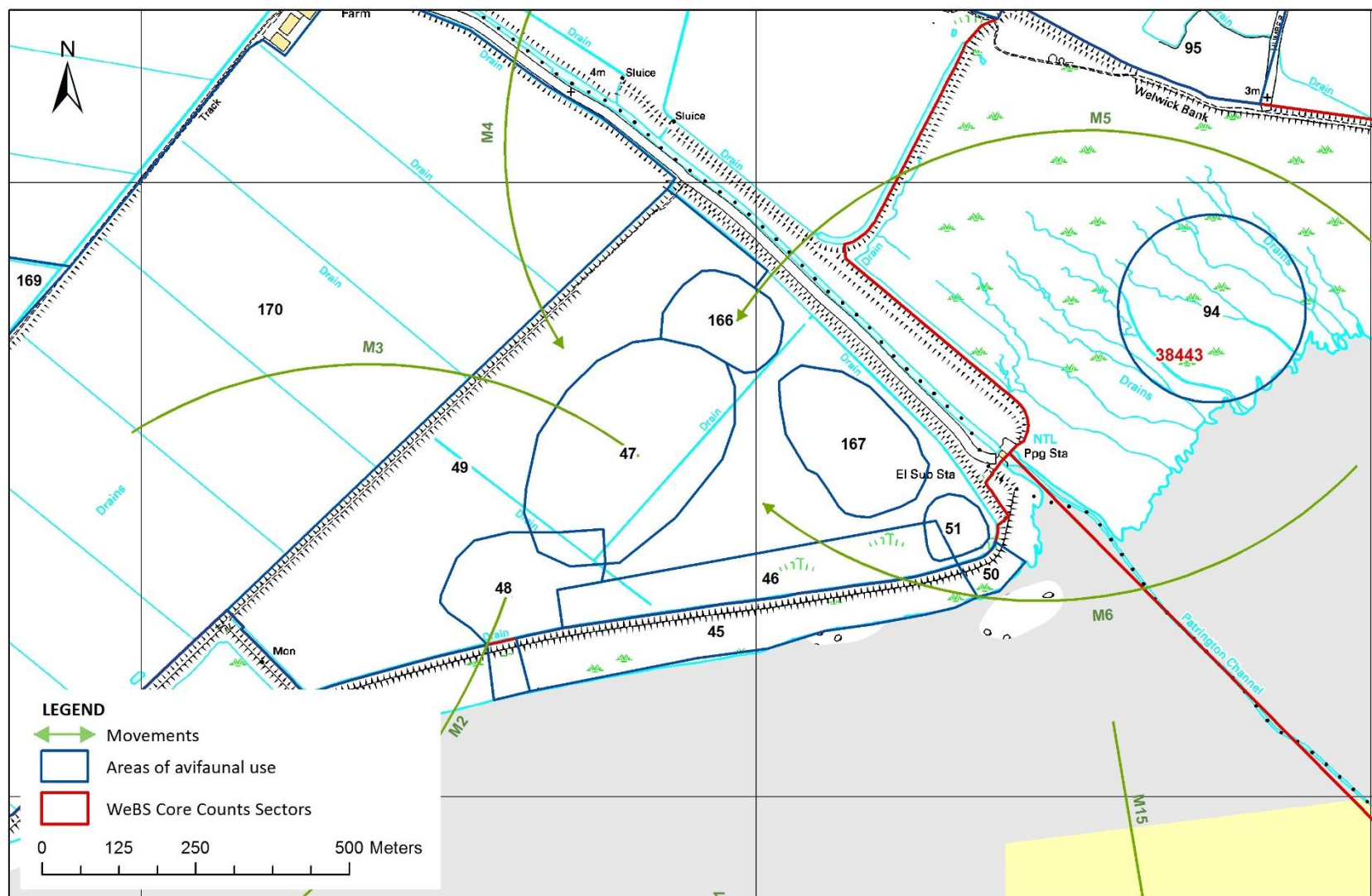
No additional information sources were identified to provide relevant gap filling, although information broadly consolidating the extent and pattern of inland roost use around the Kilnsea to Skeffling area was identified (e.g. Environment Agency, 2008). These latter data were considered to be more generic than the information provided from the consultation phase, and therefore not included here in detail, but did indicate the potential for roost utilisation across much of the base of the Spurn peninsula almost as far north as Easington, as well as an extension inland by perhaps 500m in the roost area around Winsetts Road, east of Skeffling.



Map 1: Outer (North Bank) Estuary Roost Information



Map 1a: Outer (North Bank) Estuary Roost Information. Enlarged Kilnsea Area



Map 1b: Outer (North Bank) Estuary Roost Information. Enlarged Welwick Area

Table 1: Consultee Target Notes for Map 1 Outer Estuary (North Bank)

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
45	Outer North	Use of former river bank by Redshank, Curlew, Bar-tailed Godwit, Turnstone and Oystercatcher, particularly at high tide.	RK, CU, BA, TT, OC	
46	Outer North	Used by Curlew, Redshank, Shelduck and some Grey Plover when tide not fully inundating the area.	CU, RK, SU, GV	
47	Outer North	Main roost site for this sector for Grey Plover, Knot, Dunlin, Bar-tailed Godwit, Golden Plover, Lapwing, Shelduck and Gulls.	GV (R), KN (R), DN (R), BA (R), GP (R), L. (R), SU (R), Gull spp (R)	
48	Outer North	Shelduck, Dark-bellied Brent Goose, Curlew, Grey Plover.	SU, DB, CU, GP	
49	Outer North	Used by Curlew, Redshank, Shelduck and some Grey Plover when tide not fully inundating this area.	CU, RK, SU, GP	
50	Outer North	Used by Oystercatcher.	OC	
94	Outer North	Used for roosting by the assemblage from fronting intertidal across all tidal states up to springs. At high springs (above 7.7m at Grimsby), birds are displaced generally moving westwards to the re-alignment at the eastern part of Sunk Island.	(R)	
95	Outer North	Used by small numbers of Curlew and occasionally Redshank, Golden Plover and Grey Plover use this are very occasionally.	CU, RK, GP, GV.	
96	Outer North	Used for roosting by Oystercatcher (up to 100), Redshank (up to 50), and Dunlin (20 to 40) on neap tides (below 5.6m at Grimsby).	OC (<100R), RK (<50R), DN (20-40R)	
97	Outer North	Used for roosting and foraging by small numbers of birds mainly when fields are water-logged/holding water. Used by Curlew, Oystercatcher, Dunlin, Golden Plover and Redshank.	CU, OC, DN, GP, RK	
98	Outer North	Occasionally used for roosting and loafing by Curlew (up to 80), Redshank (up to 30) and Golden Plover (up to 500).	CU (>80), RK (>30), GP (<500)	

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
99	Outer North	Used for roosting and loafing during mid height to high springs by large numbers of Golden Plover (up to 4500 on big springs). Occasionally by small numbers of Redshank and Curlew. Brent Geese and other species of geese have also been reported here.	GP (<4500R/L), RK, CU, BG, Geese spp.	
100	Outer North	Used for roosting and loafing by small numbers of Golden Plover on spring tides. Occasionally by Brent Geese and, if in the area, other geese species.	GP (R/L)	
101	Outer North	Used by most species of wader when tide is low (less than 5.6m at Grimsby). This seems to have altered little since the survey carried out by Milson & Tasker 1979.	Wader spp.	
139	Outer North	Foraging / Loafing. Brent Geese, Curlew, Redshank, Golden Plover.	BG (F/L), CU (F/L), RK (F/L), GP (F/L)	
140	Outer North	Foraging / loafing - Golden Plover, Grey Plover, Dunlin, Knot, Redshank, Curlew, Greenshank, Bar-tailed Godwit. Oystercatchers roost here in winter only.	GP (F/L), GV (F/L), DN (F/L), KN (F/L), RK (F/L), CU (F/L), GK (F/L), BA (F/L), OC (R)	
141	Outer North	Kilnsea wetlands - new wader habitat. Roosting/foraging /loafing - Golden Plover, Grey Plover, Dunlin, Knot, Redshank, Curlew, Greenshank, Bar-tailed Godwit. Oystercatchers roost here in winter only.	GP (R/F/L), GV (R/F/L), DN (R/F/L), KN (R/F/L), RK (R/F/L), CU (R/F/L), GK (R/F/L), BA (R/F/L), OC(R)	
142	Outer North	Foraging / loafing.	No additional information supplied	
143	Outer North	Roosting / Foraging/ Loafing.	No additional information supplied	

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
144	Outer North	c.200 Sanderling and 70+ Ringed Plover roost on beach at peak times. Lots of waders roost on lagoons particularly on higher tides.	SS (c.200R), RP (>70R)	
145	Outer North	Foraging/Loafing.	No additional information supplied	
146	Outer North	Narrow Neck - Warren. Roosting Oystercatcher, Knot, Dunlin, Sanderling, Redshank, Bar-tailed Godwit, Curlew, Ringed Plover, Grey Plover. This area has increased in importance since the recent breach.	OC (R), KN (R), DN (R), SS (R), RK (R), BA (R), CU (R), RP (R), GV (R)	
147	Outer North	Roosting Oystercatcher, Knot, Dunlin, Sanderling, Redshank, Bar-tailed Godwit, Curlew, Ringed Plover, Grey Plover.	OC (R), KN (R), DN (R), SS (R), RK (R), BA (R), CU (R), RP (R), GV (R)	
148	Outer North	Foraging / loafing Oystercatcher, Knot, Dunlin, Sanderling, Redshank, Bar-tailed Godwit, Curlew, Ringed Plover, Grey Plover.	OC (F/L), KN(F/L), DN (F/L), SS (F/L), RK (F/L), BA (F/L), CU (F/L), RP (F/L), GV (F/L)	
149	Outer North	c.70 roosting Ringed Plover in spring only	RP (c.70R)	
150	Outer North	Roosting Oystercatcher, Knot, Dunlin, Sanderling, Redshank, Bar-tailed Godwit, Curlew, Ringed Plover, Grey Plover.	OC (R), KN (R), DN (R), SS (R), RK (R), BA (R), CU (R), RP (R), GV (R)	
151	Outer North	Narrow Neck - Warren. Roosting Oystercatcher, Knot, Dunlin, Sanderling, Redshank, Bar-tailed Godwit, Curlew, Ringed Plover, Grey Plover.	OC (R), KN (R), DN (R), SS (R), RK (R), BA (R), CU (R), RP (R), GV (R)	
152	Outer North	Roosting Turnstone, Sanderling and Dunlin.	TT (R), SS (R), DN (R)	
Additional Note Number	Area	Additional Information Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Source
There are no Additional Information Notes for this Section				

Table 2: Consultee Movement Notes for Map 1 Outer Estuary (North Bank)

Movement Number	Area	Species	Movement Description
M1	Outer North	No info. supplied	High tide overspill to south bank
M2	Outer North	SU, DB, CU, GV	Shelduck, Dark-bellied Brent Geese, Curlew, Grey Plover
M3	Outer North	GP, L.	Golden Plover & Lapwing
M4	Outer North	GP, L.	Golden Plover & Lapwing
M5	Outer North	GP	Golden Plover
M6	Outer North	DN, CU, BA, GV	Dunlin, Curlew, Bar-tailed Godwit, Grey Plover
M15	Outer North	No info. supplied	Birds take flight and circle around Welwick and Sunk Island realignment site. Some fly out to mid river and may continue to Lincolnshire.
M16	Outer North	WADER spp.	A small number of waders move west when the area is flooded (over 5.6m tide at Grimsby). Birds move westwards and generally across Patrington Haven into sector 38442.
M17	Outer North	No info. supplied	Much to-ing and fro-ing along this area towards the top of the tides - some birds passing eastwards into sector 38444
M18	Outer North	No info. supplied	Much to-ing and fro-ing along this area towards the top of the tides - some birds passing eastwards into sector 38444
M19	Outer North	No info. supplied	Much to-ing and fro-ing along this area towards the top of the tides - some birds passing eastwards into sector 38444
M20	Outer North	No info. supplied	Much to-ing and fro-ing along this area towards the top of the tides - some birds passing eastwards into sector 38444
M21	Outer North	No info. supplied	Much to-ing and fro-ing along this area towards the top of the tides - some birds passing eastwards into sector 38444
M22	Outer North	No info. supplied	No additional information supplied
M23	Outer North	No info. supplied	No additional information supplied
M24	Outer North	No info. supplied	No additional information supplied

Movement Number	Area	Species	Movement Description
M25	Outer North	No info. supplied	No additional information supplied
M26	Outer North	No info. supplied	No additional information supplied
M27	Outer North	No info. supplied	No additional information supplied
M28	Outer North	No info. supplied	No additional information supplied
M29	Outer North	No info. supplied	No additional information supplied
M30	Outer North	No info. supplied	No additional information supplied
M31	Outer North	No info. supplied	No additional information supplied

2.2 Middle Humber

2.2.1 AREA CONTEXT

This area features a wide intertidal area on the north bank (c. 1km width), which narrows along the Hull frontage, and is reduced on the south bank to usually a few hundred metres. The intertidal mudflats are backed by hard flood defences, and whilst the majority of the north bank features low lying arable land behind the defences, on the south bank there is a mix of land uses from agricultural land to car storage and other industries associated with the ports complexes present along the reach.

2.2.2 ROOST REVIEW FINDINGS

Map 2 provides information from the consultation exercise for the middle estuary. Consultation responses for the north bank included one of the few where evidence of no roost usage was provided, this for the frontage and inland fields running west from Hawkins Point to Stone Creek (TN 52). On Cherry Cobb Sands a regular wader roost was identified on the mid to upper shore (TN 55), this area noted as being used by Grey Plover, Bar-tailed Godwit, Dunlin and Redshank. This general area has undergone a process of vegetation colonisation over recent years, with a large fronting marsh developing in some areas. The consultee comment regarding a reduction in the roost status of the 'old marsh' (TN 56) therefore suggests that with the extension of vegetation across the upper shore mudflat area, function has changed with roost activity developing on the newly evolving elevated marsh areas.

Although no consultee response was provided for the Paull Home Strays managed realignment area, author observations (N. Cutts pers. comm.) (TN 175) are that on neap tides, areas of the Paull Holme Strays managed realignment site are used as a roost by Golden Plover and Black-tailed Godwit and the arable fields inland to the north-west around Boreas Hill continue to be used by Curlew, predominantly for feeding but with some loafing apparently related to tidal inundation on adjacent mudflats. Some fields are occasionally utilised as a roost/loaf by Golden Plover and Lapwing (TN 175).

The arable fields between Paull and Saltend (TN 174) continue to support roost/loafing flocks of Golden Plover and Lapwing, although in reduced numbers compared to the 1990s to early 2000s, possibly reflecting a reduced presence of the species on the fronting Saltend mudflats. Curlew and Redshank can also use these fields for roosting and foraging.

The man-made hard substratum along the Hull frontage is used by a limited avifauna, but with Turnstone present at a number of locations in regionally important numbers. There has been a historic roost of the species on derelict structures to the east of the mouth of the River Hull, however the continued use of this area is uncertain due to ports industry related development. Compensatory roost habitat has been provided but its efficacy is at the time of this report understood to be unknown (location not mapped due to uncertainty in roost use). There are additional *ad hoc* records for Turnstone roost concentrations along the west Hull frontage (not shown on the map, see 2.2.3).

On the south bank, the Pyewipe mudflat, immediately west of Grimsby Dock entrance is reported to support roosts of up to 3,000 Golden Plover and 2,000 Lapwing (TN 168), whilst up to 3,000 Black-tailed Godwit can roost on the upper shore together with 350 Redshank

and 2,500 Dunlin (TNs 40-42). Fields around the Novartis site (TNs 38 & 39) support 300 Ringed Plover when field is uncropped and 200 Curlew respectively.

There are limited data on roost use in the outer part of the area running between Pyewipe and Immingham, and additional information has been utilised to gap fill from a range of published and grey sources (see 2.2.3). However TN 37 identifies the field immediately adjacent to the South Humber Bank power station as being used by more than 3,500 Golden Plover and 1,000 Lapwing when crop conditions are suitable. This level of use is broadly consistent with observations for the area from the initial roost review.

The western part of the area, upstream from north Killingholme, features a greater level of roost utilisation based on consultee responses. This area features predominantly agricultural land behind the man-made flood defences, although many of the fields have in recent years been developed for car storage associated with the port complexes in the area. TNs 32-36 inclusive identify a series of fields between North Killingholme Haven and East Halton Skitter as being used by waders, with TNs 32, 33 and 36 used by Golden Plover and Lapwing with TN 32 a particularly important roost area for these species, and TN 35 as being used by Ruff.

The marsh fronting the flood defences on the northern bank of East Halton Skitter (TN 31) is identified as being an important roost for Snipe (*Gallinago gallinago*) (up to 80 individuals) and Jack Snipe (*Lymnocyptes minimus*) (12 individuals). The field system immediately behind the flood defences on the north-eastern side of Skitterness is identified as supporting roosts by a range of species including Golden Plover (e.g. 2,000 in TN 22) and Lapwing (2,500 in TN 25), with birds using the fields in the area both to roost and feed depending on crop. Fields in this area were recorded as being of value for roosting Golden Plover and Lapwing in the initial roost review. TN 24 is noted as supporting up to 90 Curlew and 200 Black-tailed Godwit, with Curlew also utilising the wider area, presumably both as a roost and foraging resource, and with up to 350 Pink-footed Geese (*Anser brachyrhynchus*) recorded feeding here (TN 27). The fronting marsh has been identified as reducing in value in some areas due to vegetation cover, but TN 26 is used by Dunlin and Redshank as well as Black-tailed Godwit.

The consultee responses indicate that the network of fields around East Halton Skitter and on Skitterness (e.g. TNs 28 & 29), together with areas of the fronting saltmarsh (TNs 30 & 31) continue to provide a valuable roost resource for a number of wader species in substantial numbers, this area having also been identified as an important roost from the initial roost review. In fact some species are present in numbers of regional importance (e.g. Golden Plover and Snipe).

The consultation also identified a series of fields being utilised between Goxhill Haven and Barton upon Humber. Up to 6,000 Golden Plover and 4,500 Lapwing are shown on TN 20 to the east of New Holland, although with a reduction in numbers noted from recent years. Interestingly, structures in the intertidal (derelict barge TN 108) and subtidal (pier TN 19) are recorded as being used by concentrations of Turnstone with 450 recorded on TN 19 and regularly between 50 and 100 Redshank on TN 108, together with other species.

The inland fields to the west of New Holland (TN 16 and TN 17) are shown to support up to 2,000 Lapwing and 1,500 Curlew, this latter figure representing a substantial proportion of

the middle estuary population. However, field TN 13 which has historically been an important Curlew area is reported to have declined in value, this being attributed to drainage.

2.2.3 ADDITIONAL INFORMATION

Information on ornithological usage collected by studies relating to the Able compensation scheme (immediately north-west of Stone Creek) (Environmental Resources Management, 2011) provides additional information on roost use in fields immediately to the north-east of TN 52. Curlew are reported foraging in fields around Salthaugh Sands farm and roosting in the fields north-west of Stone Creek House, with up to 640 Curlew recorded roosting in these fields during the autumn/early winter, as well as some Lapwing utilisation and occasional roost use by Golden Plover, Grey Plover, Ruff (*C. pugnax*) and Dunlin. Survey work undertaken as part of the proposed Far Marsh Farm windfarm (e.g. Food and Environmental Research Agency, undated) also identified usage by Curlew and Golden Plover in fields within the Salthaugh Sands area, although Golden Plover were recorded as being in relatively small flocks in the fields, whilst Curlew were also recorded. Use of fields by waders to the east, north and west of the windfarm site was also noted. In addition to field usage, the Far Marsh Farm survey work recorded considerable movement of waders around the general area. This includes Golden Plover flight-lines originating from the Salthaugh Sands to Stone Creek Farm area and moving in most directions (including a series of flights between this area and the estuary) as well as further flight activity around Far Marsh Farm (inland by c. 2-3km) on occasion. A similar but more compact flight-line pattern was recorded for Curlew with a concentration of usage around the fields of Salthaugh Sands and the estuary, with additional but less frequent movement further inland, north of Far Marsh Farm (Food and Environmental Research Agency, undated).

It should be noted that as with many other arable areas adjacent to the estuary, take-up of fields as bird roost sites will to some extent be dependent on the crop type and its status. As such, whilst a general area will often be habitually used for roosting (and foraging) activity, individual field use may vary depending on season and year.

Ornithological survey work undertaken in recent years as part of the Green Port Hull project (e.g. URS, 2011) has recorded the presence of several hundred Turnstone roosting on the derelict jetty structure fronting the mudflat immediately to the east of the Alexandra Dock lock entrance. Similar roost usage by the species was been recorded in the spring of 2014 (K. Hemingway pers. comm.), with additional occasional roost utilisation on the flood protection structures to the west of the mouth of the River Hull.

On the south bank, although not noted in the WeBS counter responses, there is a body of evidence to identify the importance of the North Killingholme Haven Pits as an important roost site for a number of species. The site regularly supports roost flocks of Black-tailed Godwit in excess of the international importance threshold, together with other species in large numbers including Lapwing, Dunlin and Redshank (e.g. Catley, 2006; 2011). Peak numbers of most species appear to have fallen slightly between the two survey years, apart from Dunlin. However, the Black-tailed Godwit utilisation remains well in excess of the international importance threshold, the site supporting the majority of the Humber population of this species around high water (AN A).

Survey work undertaken as part of the ABP Immingham Western Deepwater Jetty development proposal in 2012-2013 recorded small numbers of Curlew (maximum of 22)

roosting on the 'Triangle Site Field', a field located on Killingholme Marshes (URS, 2013). Foraging was also recorded from this field by the species, with greater numbers using the field for this function. Loafing/roosting activity in this field was additionally recorded for Curlew and Lapwing in the summer/autumn of 2014, but with limited tidal dependency (N. Cutts pers. comm.) and for limited numbers, and with sward height observed to have a significant effect on take-up (e.g. the field was down as a grass ley and was only used by waders when a crop had been taken). This cropping across the field was only partial, with roost (and foraging) activity restricted to areas which had been cut. However, these observations are contrary to those reported by ABP from surveys undertaken in 2012-2013, which recorded a more consistent usage of the field independent of its crop condition (URS, 2013).

Other fields in this area (e.g. between the estuary and Rosper Road) have been reported as being used by Curlew e.g. as part of the ABP Immingham Western Jetty development (URS, 2013), although with function not identified. Further observation of use in this area has similarly seen Curlew utilisation (N. Cutts pers. comm.), including on the grassed tank farms, but with the majority of use apparently for foraging individuals with relatively limited loafing and roosting use.

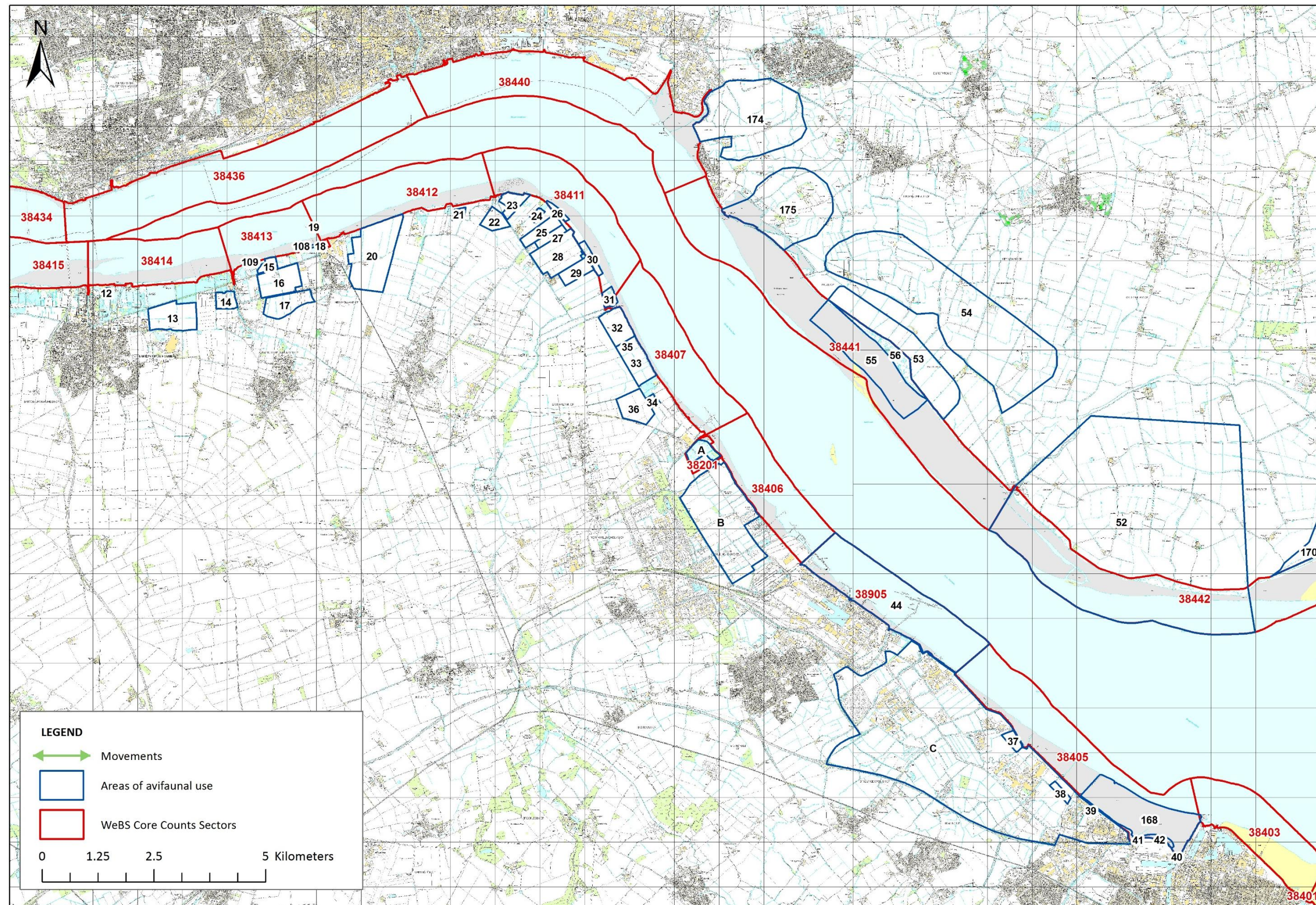
In fact, survey effort across the wider North Killingholme Marshes field complex has recorded use by a range of species on occasion including Lapwing, Dunlin, Avocet, Curlew, Whimbrel (*N. phaeopus*) and Ruff (e.g. Catley 2006, 2007, 2008, 2011) (AN B).

The ABP Immingham Western Deepwater Jetty programme (URS, 2013) also recorded utilisation of the Triangle Site Field by Black-tailed Godwit, albeit for foraging, with occasional Lapwing use also recorded including small numbers of roosting individuals on a small number of occasions. However survey work (N. Cutts pers. comm.) for this field from 2014 did not record any Black-tailed Godwit use, but did identify additional occasional flock use by Lapwing, these birds primarily roosting/loafing.

Further to the east, as part of the ABP Grimsby RO-RO development (ABPmer, 2009) surveys reported utilisation of the upper shore and adjacent flood defences in the south-eastern part of the Pyewipe mudflat by roosting Redshank, with Dunlin using the green shore on all but spring tides. Curlew were reported as primarily roosting on the former Huntsman Tioxide site (currently derelict) and adjacent playing fields.

In addition to the above development specific works, a programme of wintering and migratory bird surveys has been undertaken between Skitter Ness and Grimsby (the South Humber Gateway (SHG)) over the period 2007 to 2011. This study has covered the hinterland of the reach inland to between 1km and 5km, an area of approximately 1000ha, and whilst the specific reports should be used to derive key usage details from this comprehensive survey programme, the SHG supports regionally important (>1% of the Humber population) of Golden Plover, Lapwing, Curlew, Whimbrel and Ruff (AN C). Areas of high use include fields to the south of East Halton Skitter down towards North Killingholme and north-west from Pyewipe to Immingham for a number of species, including Golden Plover, Lapwing and Curlew e.g. Catley, 2011; Cutts *et al.*, 2009.

It is emphasised that considerable survey effort has been applied to the wider SHG area in recent years, and for a detailed investigation of roost usage across this area (e.g. the area covered by AN C), then this more detailed resource should be accessed.



Map 2: Middle Estuary Roost Information

Table 3: Consultee Target Notes for Map 2 Middle Estuary

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
12	Middle estuary	70-80 roosting Redshank and occasionally low no.'s of Black-tailed Godwit.	RK (70-80R), BW	
13	Middle estuary	Historically important for Curlew but use has declined, seemingly due to drainage.	CU	
14	Middle estuary	80-90 Curlew.	CU (80-90)	
15	Middle estuary	Used by Curlew.	CU	
16	Middle estuary	Up to 1500 Curlew and 2000 Lapwing.	CU (1500), L. (2000)	
17	Middle estuary	Up to 1500 Curlew and 2000 Lapwing.	CU (1500), L. (2000)	
18	Middle estuary	120 Redshank.	RK (120)	
19	Middle estuary	Roost of up to 450 Turnstone in previous years.	TT (450R)	
20	Middle estuary	Up to 6000 Golden Plover and 4500 Lapwing but numbers have declined in recent years.	GP (6000), L. (4500)	
21	Middle estuary	Up to 1000 Lapwing and 500 Golden Plover usually in centre of field.	L. (1000), GP (500)	
22	Middle estuary	Up to 2000 Golden Plover usually in July to August.	GP (2000)	
23	Middle estuary	Used by Dunlin and Ringed Plover in autumn and Golden Plover in winter.	DN, RP, GP	
24	Middle estuary	Up to 90 Curlew and occasionally 200 Black-tailed Godwit.	CU (90), BW(200)	
25	Middle estuary	Up to 2500 Lapwing in winter.	L. (2500)	

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
26	Middle estuary	Dunlin and Redshank roost with lower use by Black-tailed Godwit.	D (R), RK (R), BW	
27	Middle estuary	Regularly used by up to 350 Pink-footed Geese although more feeding.	PG (>350)	
28	Middle estuary	Widespread use by Curlew, mainly for feeding.	CU (F)	
29	Middle estuary	Widespread use by Curlew, Lapwing and Golden Plover mostly for feeding but crop-dependant.	CU (F), L. (F), GP (F)	
30	Middle estuary	Used to be important site but use declined as vegetation height increased.	N/A	
31	Middle estuary	Important site for up to 80 Snipe and 12 Jack Snipe.	SN (80) JS (12)	
32	Middle estuary	Key Golden Plover and Lapwing roost.	GP (R), L.(R)	
33	Middle estuary	Golden Plover and Lapwing roost (lower use)	GP (R), L (R)	
34	Middle estuary	Curlew with lower numbers of Lapwing.	CU, L.	
35	Middle estuary	10-20 Ruff use various fields.	RU (10-20)	
36	Middle estuary	Golden Plover and Lapwing.	GP, L.	
37	Middle estuary	Used by >1000 Lapwing and >3500 Golden Plover during favourable cropping conditions.	L. (>1000), GP(>3500)	
38	Middle estuary	Up to 300 Ringed Plover on autumn passage when field uncropped.	RP (300)	
39	Middle estuary	Up to 200 Curlew.	CU (200)	
40	Middle estuary	Up to 2500 Dunlin in winter.	DN (2500)	

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
41	Middle estuary	Up to 350 Redshank dependant on tides.	RK (350)	
42	Middle estuary	Depending on tide, Black-tailed Godwits (up to c.3000) roost along upper shore in winter.	BW (<c.3000)	
44	Middle estuary	ABP data (no additional information provided by the consultee but assumed to be in relation to Immingham Outer Harbour works)	Not provided	
52	Middle estuary	No high tide roosts. Curlew used fields but not as regularly as the Patrington roost.	CU	
53	Middle estuary	Occasional high tide roost for Dunlin, Curlew, Grey Plover and Golden Plover. The area is used during the inundation of the Cherry Cobb saltmarsh.	DN, CU, GV, GP	
54	Middle estuary	Consultee has no knowledge of this area (so not an absence of potential use).	N/A	
55	Middle estuary	Key regular high tide roost for wading birds. In particular Dunlin, Redshank, Bar-tailed Godwit and Grey Plover. The inundation of Cherry Cobb saltmarsh during high spring tide conditions leads to the dispersion of birds inland of flood defences.	DN, RK, BA, GP	Only disturbance is by raptors.
56	Middle estuary	'old saltmarsh' used less than previously as roost on intertidal saltmarsh now favoured.	(R)	
108	Middle estuary	Remnants of old barge provide roosting platform on higher tides for occasional Knot, Dunlin and Turnstone. Also, regular use by large numbers of Redshank e.g. regularly between 50 and 100 peaking at 184 in Jan 2013. Not used on neap tides.	KN (R), DN (R), TT (R), RK (<184R)	This roost is prone to indirect disturbance because it is close to the footpath though there is no direct access to it.

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
109	Middle estuary	Rocky promontory protruding at Barrow Haven which on higher tides (Aug & Sept 2013) roosted up to 120 Lapwing. They haven't been there in other months.	L. (<120R)	This location is close to and easily accessible from a well-used public footpath. For birds to be using it there must be virtually nowhere else suitable to go.
168	Middle estuary	Up to 3000 Golden Plover and 2000 Lapwing roost on intertidal.	GP (<3000R), L. (2000R)	
174	Middle estuary	Up to several thousand Golden Plover and Lapwing roost/loaf although numbers have declined over the last 10 years or so possibly reflecting a decline in numbers using the Saltend frontage. Curlew and Redshank can also feed/loaf here.	GP (<2000R), L (<1000R), CU & RK	
175	Middle estuary	Fields around Boreas Hill used by Curlew for feeding and some loafing. Golden Plover and Lapwing occasionally loaf.	CU F/R, GP & L (<1000 occ.)	
Additional Note Number	Area	Additional Information Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Source
A	Middle estuary	Peak counts from 2006 & 2011 survey reports for North Killingholme Pits show regular use of the wetland by Black-tailed Godwit, Dunlin, Lapwing, Ruff, Curlew & Redshank.	BW R/L (>5,000), DN R/L (>3,000), L R/L (>3,000), RU (30) & RK (1,700)	Catley (2006; 2011)
B	Middle estuary	Fields in the North Killingholme Marshes complex found to support a number of wader species including Black-tailed Godwit, Avocet, Lapwing, Ruff, Whimbrel & Curlew.	BW (53), AV (47), L (440), RU (10), WM (12) & CU (118)	Catley (2006; 2007; 2008; 2011)
C	Middle estuary	South Humber Gateway. This extensive terrestrial area has been surveyed in detail for around 10 years, with a number of reports produced. Details are therefore not given here but include use by Black-tailed Godwit, Golden Plover, Lapwing and Redshank.	BW (145), GP (650), L (754) & CU352	Catley (2006; 2007; 2008; 2011)

Table 4: Consultee Movement Notes for Map 2 Middle Estuary

Movement Number	Area	Species	Movement Description
There are no Consultee Movement Notes for the Middle Estuary			

2.3 Inner Humber & Tidal Tributaries

2.3.1 AREA CONTEXT

The eastern part of this section of the estuary is characterised by narrower fringing intertidal areas, although with cobble habitat present as well as mud. There are also several large mid channel banks including the vegetated Read's Island, although this has undergone erosion and loss of area in recent years. Waterbird abundance levels tend to be lower in this area, reflecting both reduced habitat area and for some species, reduced prey abundance.

The upper (western) part of the inner estuary is characterised by moderately wide mudflats together with several mid channel banks. In recent years, the intertidal area has been subject to considerable colonisation by saltmarsh and reedbed, with Whitton Sand now a well-established vegetated island. At Alkborough a large managed realignment site has been developed, and data from the 2014 bird report for the Alkborough site indicates often high levels of usage by wildfowl and wader species, including roost/loafing utilisation. An additional area of mixed wetland habitat is present at the Blacktoft Sands reserve.

The River Ouse features a narrow steeply shelving channel and the area in general is constrained by man-made flood defence banks. For the most part the immediate hinterland consists of arable fields.

2.3.2 ROOST REVIEW ANALYSIS

Roost activity for the eastern part of the inner north bank is centred around Brough Airfield and Welton Waters (TNs 102-105). The eastern side of Brough Airfield has been historically used by Golden Plover, Lapwing and Curlew, and the recent consultee comments indicate that this continues. A further area of arable field between North Ferriby and Brickyard Lane (TN 106) is used by Curlew both for feeding and loafing when crop conditions are suitable.

The western part of the inner north bank section between Brough and Weighton Lock features an extensive marsh and reedbed habitat fronting the flood bank and areas of this are used by Shelduck and Curlew (TNs 157-159; 163), with the fronting high mudflat also used on neap tides (TN 162). Only extreme spring tides cover the vegetated areas and when this occurs, then fields adjacent to the frontage are used by Curlew (TN 161). An area of grass fronting reedbed (TN 154) has been used as a Wigeon (*Anas penelope*) and wader roost, although use has declined in recent years with vegetation developing in front of the 'lawn'. A further 'lawn' area has however developed on Whitton Sand (TNs 155 & 124) and is used on occasion by Wigeon for foraging, but also as a loafing area. This habitat can also support large numbers of loafing geese (Greylag (*A. anser*), Canada (*B. canadensis*) and Barnacle (*B. leucopsis*)), as well as waders, primarily Lapwing, with over 1,000 roosting here on occasion.

To the east of the vegetated Whitton island (TN 125), the mid channel bank is used as a loaf/roost by a large number of mixed gulls and Shelduck across most tides, with birds only pushed off around high water. This area can also be used by Pink-footed Geese, and regularly supports flocks of Golden Plover and Lapwing in flocks well in excess of 1000 individuals, e.g. 4000 Golden Plover and 3000 Lapwing (P. Short pers. comm.), with flocks of Golden Plover on occasion being recorded in excess of the international importance threshold for the species (P. Short; N. Cutts pers. comm.).

Fields inland of this area on the north bank can be used by Pink-footed Geese, primarily for foraging (e.g. TN 165 & 172), with considerably longer distance foraging movements occurring from this area of the Humber onto the Yorkshire Wolds in the autumn of 2014 & 2015 (N. Cutts pers. comm.).

The mixed wetland habitat of Blacktoft Sands (e.g. TN 118) supports a range of wildfowl, as well as Lapwing and Golden Plover, with the fields inland from the reserve (TN 122) also used by these, together with foraging Ruff and Pink-footed Geese. The Blacktoft area can also support between 500-800 Dunlin (TNs 119 & 121). The wider inland area (TN 123) has supported up to 8,000 Pink-footed Geese in recent years, although as noted above, large flocks were also observed moving onto the Yorkshire Wolds to feed in autumn 2014 and 2015 (N. Cutts pers. comm.).

The River Ouse can support large concentrations of Mallard (*A. platyrhynchos*), with 150 reported by consultees, but over 350 observed roosting on the channel banks at Swinefleet (K. Hemingway pers. comm.) and 250 reported from off Whitgift (TN 115). Fields adjacent to the river are often used by Golden Plover and Lapwing e.g. TN 113, with Howdendyke Lee and adjacent fields also utilised (N. Cutts pers. comm.). At low tide the mudflats around Howdendyke island are used by loafing / roosting Golden Plovers (up to 6000) and Lapwing (up to 2500) (M. Pilsworth pers. comm.).

The inland arable land between the Rivers Ouse and Trent (TN 123) was identified as supporting foraging Pink-footed Geese in large numbers (8000).

As noted above, the relatively new habitat within the Alkborough managed realignment site has been seen to support a number of wildfowl and wader species in large numbers, including flocks of over 10,000 Golden Plover and 6,000 Lapwing.

The upper estuary south bank includes several inland fields behind the Alkborough escarpment identified as being used by Curlew (TNs 1 & 43), with fields to the east of Whitton used both by Curlew and other species including Pink-footed Goose. In particular, TN 4 was reported by the consultee as being able to support up to 4,000 Golden Plover and Lapwing, together with 2,000 Dunlin on spring tides during the early autumn.

Fields to the west of South Ferriby (TNs 8 & 9) support usage by Curlew, Golden Plover and Lapwing, together with occasional Redshank and Dunlin.

Although not specifically identified during the initial consultation phase, there are a number of large flock movements between key sites in the inner estuary, and in particular between Read's Island-Alkborough-Whitton Sand- Blacktoft (P. Short pers. comm.). There are also interactions between Whitton Sand, Broomfleet Island and inland fields (see Map 3), but with a reduction in movement in recent years between Brough Airfield and Broomfleet Island (N. Cutts pers. comm.).

2.3.3 ADDITIONAL INFORMATION

Ornithological survey work relating to a development of fields adjacent to the estuary and between North Ferriby and Brickyard Lane recorded a reasonable level of usage by Curlew (maxima of 130 individuals) during the winter of 2009/2010, with a small number of other waders, e.g. Golden Plover, also present on occasion. From the available information, it

would appear however that the Curlew utilisation was for foraging, rather than as a roost site (FPCR, 2013).

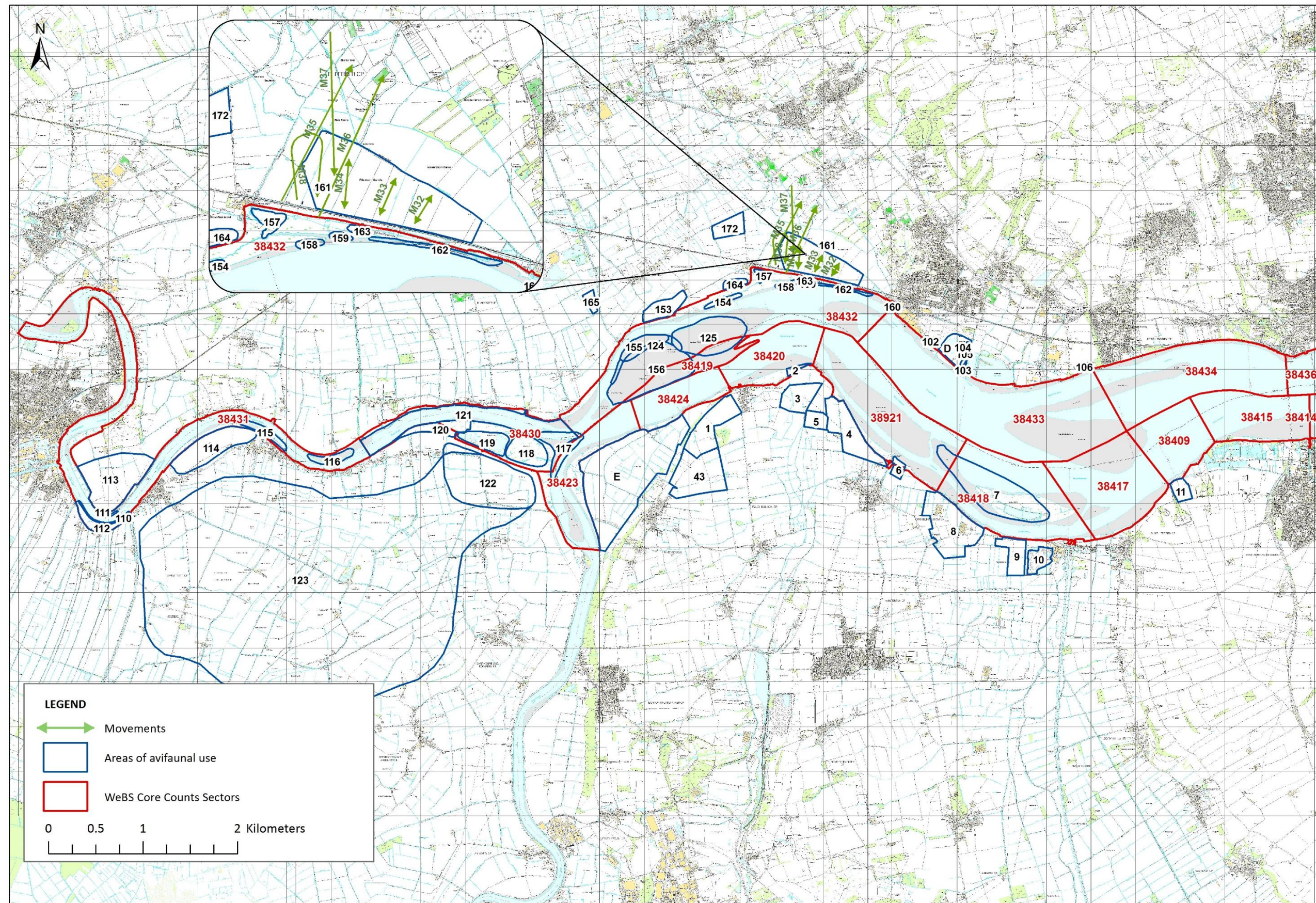
Surveys for development plans on Brough Airfield over the 2008 to 2009 and 2010 to 2011 periods have indicated that the site is utilised by flocks of Golden Plover and Lapwing (Brooks Ecological 2011 & 2012). Utilisation by these species was up to a maximum of 475 Golden Plover and 484 Lapwing, together with 21 Black-tailed Godwit and approximately 50 Curlew also regularly recorded. Although the information presented does not identify whether these birds were roosting or foraging, as the majority of maxima were for around the high water period this would suggest roost/loaf activity (albeit with smaller flocks also present around low water on some surveys). Small numbers of other waders, e.g. Snipe, Curlew and Redshank were also present on a number of occasions, together with waterfowl, the latter presumably primarily utilising the wetland areas of the site (AN D). Lapwing and Golden Plover utilise the airfield regularly in flocks of over 100 individuals as a loafing/roost site (N. Cutts pers. comm.) and may also undertake nocturnal foraging in this area. Other waterbird species can be present on occasion, with the wetland area to the south east of the new flood defence bank primarily used (N. Cutts pers. comm.).

An ornithological survey programme relating to a proposed wind turbine development to the west of Ellerker (north bank) (ECUS, 2014) recorded a number of movements to and from the estuary by Pink-footed Goose, Golden Plover and Lapwing (see Map 3 and Table 6). However the Pink-footed Goose movements were considered to be foraging activity rather than in relation to roosting requirements, whilst for Golden Plover and Lapwing, a degree of flight movement will occur between inland foraging sites and loafing/roosting areas on the estuary (N. Cutts pers. comm.).

The section inland from the River Trent between Alkborough and Burton upon Sather has been identified as an important reach for Curlew (A. Moody pers. comm.).

Bird survey work at the Alkborough managed realignment site has recorded high numbers of waterfowl using the area both as a foraging and roosting resource, with an assemblage maxima of 26,000 waterbirds reported for November 2011 (A. Moody pers. comm.). Peak activity from 2011/12 includes up to c. 3,000 Teal, 1,400 Wigeon, 14,000 Golden Plover, 8,000 Lapwing, 40 Ruff, 840 Black-tailed Godwit and 540 Curlew (A. Moody pers. comm.) (AN E). Whilst from the information it is not certain that all of the above were roosting within the site, there is a likelihood that a substantial proportion of these individuals would on occasion be roosting on site as well as feeding.

It should be noted that there are a number of ornithological survey reports relating to the Alkborough managed realignment site, providing detailed characterisation of species and usage and these reports should be used for any detailed investigation of roost use of the site e.g. Catley (Nyctea Ltd) undated.



Map 3: Inner Estuary Roost Information

Table 5: Consultee Target Notes for Map 3 Inner Estuary

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
1	Inner estuary	Used by Curlew for feeding and by Pink-footed Goose.	CU (F), PF	
2	Inner estuary	Some variable use by Curlew for feeding and roosting.	CU (F&R)	
3	Inner estuary	Widely used by Curlew.	CU	
4	Inner estuary	Can hold up to 4000 Golden Plover and Lapwing. Some use by Curlew and Ringed Plover. Can hold up to 2000 Dunlin on spring tides in August and September.	GP/L. (4000R), CU, RP, DN (2000)	
5	Inner estuary	Lesser use by Curlew.	CU	
6	Inner estuary	Curlew will roost on spring tides when disturbance is low.	CU (R)	
7	Inner estuary	N/A	N/A	Change in mudflat extent
8	Inner estuary	Widespread Curlew use.	CU	
9	Inner estuary	Lapwing and Golden Plover use with occasional Dunlin and Redshank.	L., GP, DN, RK	
10	Inner estuary	Historically this roost held up to 400 Ringed Plover and Dunlin (August and September). Harder to view now.	RP/DN (400R)	
11	Inner estuary	Curlew use c.40.	CU (40)	
43	Inner estuary	Whole area used widely by feeding Curlew and by Pink-footed Goose.	CU (F), PF	
102	Inner estuary	N/A	N/A	Rarely/ never used (adjacent to a public footpath)

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
103	Inner estuary	Loafing and feeding Curlew.	CU (L/F)	
104	Inner estuary	Curlew	CU	
105	Inner estuary	Roosting/ feeding medium size flocks of both Lapwing and Golden Plover.	L. (R/F), GP (R/F)	
106	Inner estuary	Curlew loafing / feeding. Winter/early spring before arable crops grow too high.	CU (L/F)	
110	Inner estuary	Important for Mallard (up to 150 Autumn/winter).	MA (<150)	
111	Inner estuary	Important for Mallard (up to 150 Autumn/winter).	MA (<150)	
112	Inner estuary	N/A	N/A	Breeding utilisation noted
113	Inner estuary	Fields for Golden Plover <1000 and Lapwing <500.	GP (<1000), L. (<500)	
114	Inner estuary	Fields hold Lapwing, Golden Plover, up to several 100 Greylag Geese and small numbers of Pink-footed Geese.	L., GP, GJ (c.200-300), PG	
115	Inner estuary	Most important area on this stretch for Mallard up to 250.	MA (<250)	
116	Inner estuary	Lapwing and Golden Plover loaf in this area at low tide. Mallard loaf at high tide.	L. (L), GP (L), MA (L)	
117	Inner estuary	Loafing flocks of Golden Plovers and Lapwing at low tide. Wildfowl also particularly include Wigeon, Teal and Mallard.	GP (L), L. (L), WN, T., MA	
118	Inner estuary	Roosting Hen Harriers and Marsh Harriers	HH (R), MR (R)	
119	Inner estuary	Bunded lagoons - wildfowl such as Wigeon, Teal are present through winter. Used by waders in the spring including Black-tailed Godwit and Avocet. In summer/autumn Black-tailed Godwit, Ruff, Redshank, Spotted Redshank etc and wildfowl are present.	WN, T., BW, AV, BW, DN, RU, RK, DR	

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
120	Inner estuary	Grazing marsh and seasonal pools. Autumn/winter - used by wildfowl such as Teal, Wigeon and Mallard and waders such as Lapwing, Golden Plover and Curlew.	T., WN, MA, L., GP, CU	
121	Inner estuary	River Ouse - Wildfowl - especially Wigeon and Teal. The river is important during cold weather.	WN, T, DN	
122	Inner estuary	Flocks of Golden Plover, Lapwing, foraging Ruff and Pink-footed Geese.	GP, L., RU (F), PG	
123	Inner estuary	Area regularly used by up to 8000 Pink-footed Geese in the last three winters.	PG (8000)	
124	Inner estuary	Short 'turf' Wigeon, waders, Avocets.	WN, WADERS spp., AV	
125	Inner estuary	Pink-footed Geese roosting, large numbers of Golden Plovers, Lapwing, Dunlin and Wigeon.	PG (R), GP, L., DN, WG	
153	Inner estuary	Greylag Goose - roosting/ feeding.	GJ (R/F)	
154	Inner estuary	Wigeon & Barnacle Geese feeding on 'lawn' & occasional wader roost.	WN (F), BY (F), WADERS spp. (R)	
155	Inner estuary	Grass area. Wigeon & Lapwing roost. Greylag, Barnacle, Canada Goose roost/feed/breed.	WN (R), L. (R), GJ (R/F/B), BY (R/F/B), CG (R/F/B)	
156	Inner estuary	N/A	N/A	Rank vegetation noted as affecting roost use.
157	Inner estuary	Limited use by Shelduck and Curlew for roosting and loafing.	SU (R/L), CU (R/L)	
158	Inner estuary	Shelduck and Curlew loaf at high water.	SU (L), CU (L)	

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
159	Inner estuary	Area of high shore used by Curlew, Golden Plover, Lapwing, and Shelduck on neap tides but reducing in quality due to vegetation.	CU, GP, L., SU	
160	Inner estuary	Teal and Mallard roost.	T. (R), MA (R)	
161	Inner estuary	Area of Curlew roosting at high water but movement and location unknown.	CU (R)	
162	Inner estuary	Area of high shore used by Curlew, Golden Plover, Lapwing, and Shelduck on neap tides but reducing in quality due to vegetation.	CU, GP, L., SU	
163	Inner estuary	Curlew sub-roost.	CU	
164	Inner estuary	Occasional use by Greylag Geese.	GJ	
165	Inner estuary	Pink-footed Geese feed occasionally.	PG (F)	
166	Inner estuary	Redshank and Black-tailed Godwit	RK, BW	
167	Inner estuary	Knot, Bar-tailed Godwit, Dunlin, Curlew,	KN, BA, DN, CU	
170	Inner estuary	Lapwing and Golden Plover feed on autumn crops. Usage dependant on cropping.	L. (F), GP (F)	
172	Inner estuary	Pink-footed Geese (120)	PG (120)	
Additional Note Number	Area	Additional Information Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Source
D	Inner estuary	Utilisation primarily of the wetland area to the south-east of the new (inland) flood defence bank and PRoW.	GP (450), L (484), BW (21) & CU (50)	Brooks Ecological 2011 & 2012; N. Cutts (pers. com.)
E	Inner estuary	Alkborough managed realignment area with usage including Shelduck, Teal, Wigeon, Golden Plover, Lapwing, Ruff, Black-tailed Godwit, Redshank & Curlew.	T (3,000), WN (1,400), GP (14,000), L (8,000) RU (40), & BW (840)	A. Moody (pers. comm.)

Table 6: Consultee Movement Notes for Map 3 Inner Estuary

Movement Number	Area	Species	Movement Description
M32	Inner estuary	CU	Movement of Curlew from unknown adjacent inland location. Movement not always related to tidal state.
M33	Inner estuary	CU	Movement of Curlew from unknown adjacent inland location. Movement not always related to tidal state.
M34	Inner estuary	CU	Movement of Curlew from unknown adjacent inland location. Movement not always related to tidal state.
M35	Inner estuary	PG	Flight lines for Pink-footed Geese
M36	Inner estuary	PG	Flight lines for Pink-footed Geese
M37	Inner estuary	PG	Flight lines for Pink-footed Geese
M38	Inner estuary	PG	Flight lines for Pink-footed Geese

2.4 Outer Humber (South Bank)

2.4.1 AREA CONTEXT

In the northern part of the outer estuary, the amenity beach fronts man-made defences and the urban areas of Cleethorpes and Grimsby. This area features an extensive intertidal frontage of variable muddy sand to fine sand with relatively high disturbance and relatively low ornithological value, although flocks of some wader species are known to utilise the Cleethorpes frontage on occasion in high numbers. However, immediately to the west of the Grimsby Dock entrance a moderately wide area of mudflat (Pyewipe) has a high ornithological importance (see Section 2.2 for additional information).

The outer south bank of the estuary includes areas that are almost fully marine, with extensive sand and muddy sand intertidal areas backed by marsh and grey dune. Several large creeks are present and these, together with dune, marsh and mid shore sandbank features, create a series of more muddy basins (Map 4). There is a considerable area of marsh and dune community fronting this part of the section, with arable agricultural land immediately behind.

2.4.2 ROOST REVIEW FINDINGS

From the consultee responses, the Cleethorpes frontage does not appear to be an important foraging area, potentially given the relatively clean fine sands having a reduced feeding potential together with possible recreational disturbance events. However, the southern part of the amenity beach can support loafing flocks of waders including Golden Plover, Knot, Dunlin and Redshank (N. Cutts pers. comm.). This observation is broadly consistent with the findings from the initial High Tide Roost report (Mander *et al.*, 2006) which stated: *an area just south-east of the leisure centre is regularly used by roosting Knot, Dunlin, Bar-tailed Godwit, Oystercatcher, Grey Plover and Sanderling. Despite the very high level of disturbance, it can support large numbers of waterfowl (up to 15,000), with Knot often the most abundant species during the winter months (up to 10,000).*

The Tetney Basin area (TNs 134-137) is identified as supporting flocks of roosting Knot, Grey Plover, Bar-tailed Godwit and Dunlin on spring tides, as well as Teal (*A. crecca*), Wigeon, Brent Geese and Shelduck along the Haven (Map 4 & 4a). Inland fields (TN 133) are important for Golden Plover, Lapwing and Brent Geese.

An extensive inland arable area of fields south of this (TN 132) supports large numbers of Golden Plover, Lapwing and Brent Geese, although utilisation depends on the cropping regime. The intertidal upper shore and adjacent marsh from Northcoates Point to Horse Shoe Point (Map 4a) is identified as being used by Oystercatcher, Knot, Bar-tailed Godwit, Grey Plover and Dunlin on high tides, with Sanderling and Ringed Plover using the area on passage. A large Common Tern (*Sterna hirundo*) roost is also identified on the fringing upper shore/marsh in this area.

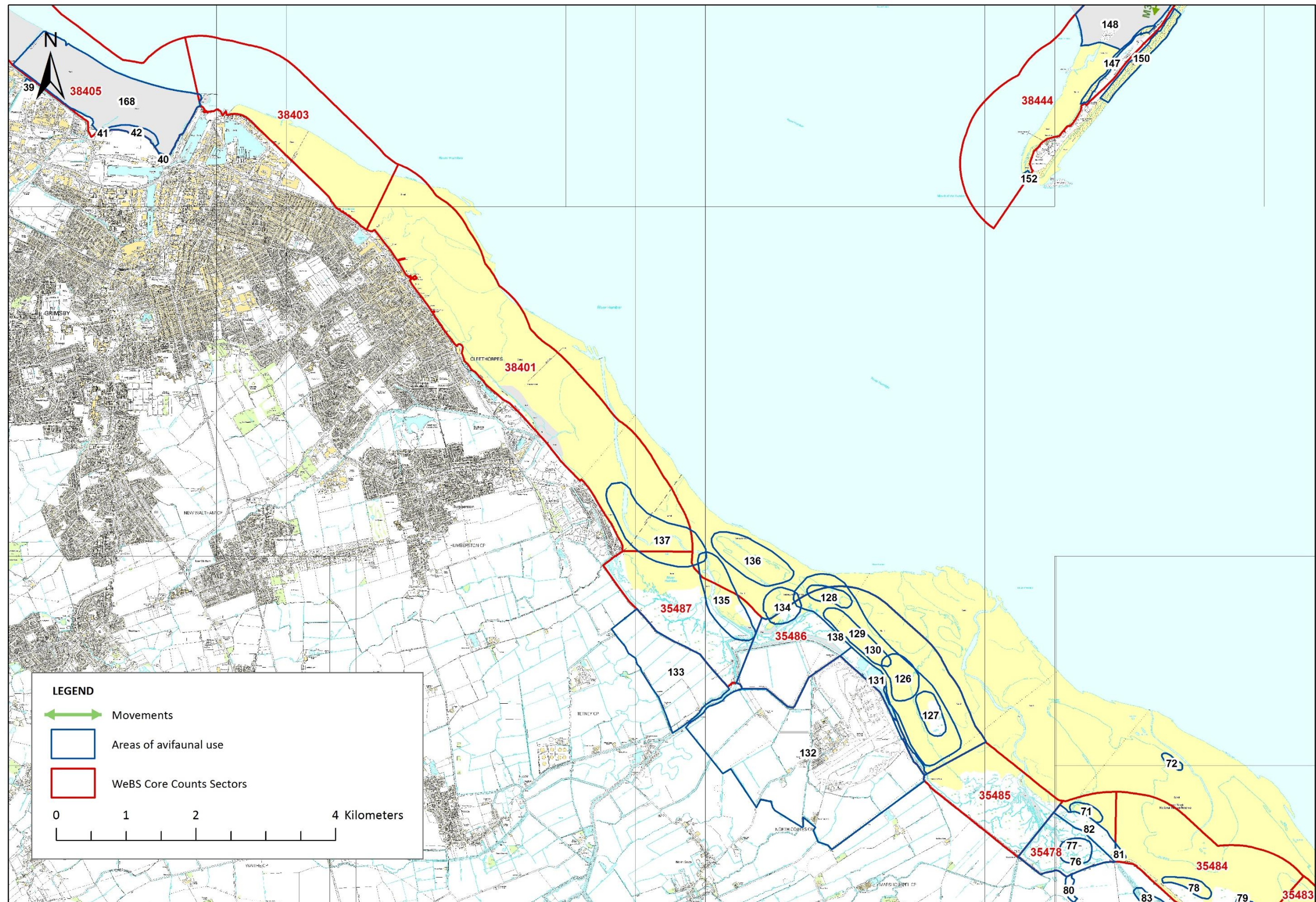
It was noted from the consultee responses that whilst the above areas were used as roosts on most tides, larger springs (greater than 7.0m at Grimsby (no datum provided)) create sufficient inundation to force flocks either to move inland and disperse widely across the area or onto more elevated areas of saltmarsh and sandbanks. The consultation also identified that as with the initial roost review undertaken in 2005/6, on very large tides (e.g.

7.8m and above at Grimsby (no datum provided)), flocks can move onto the south bank of the estuary from Spurn Bight.

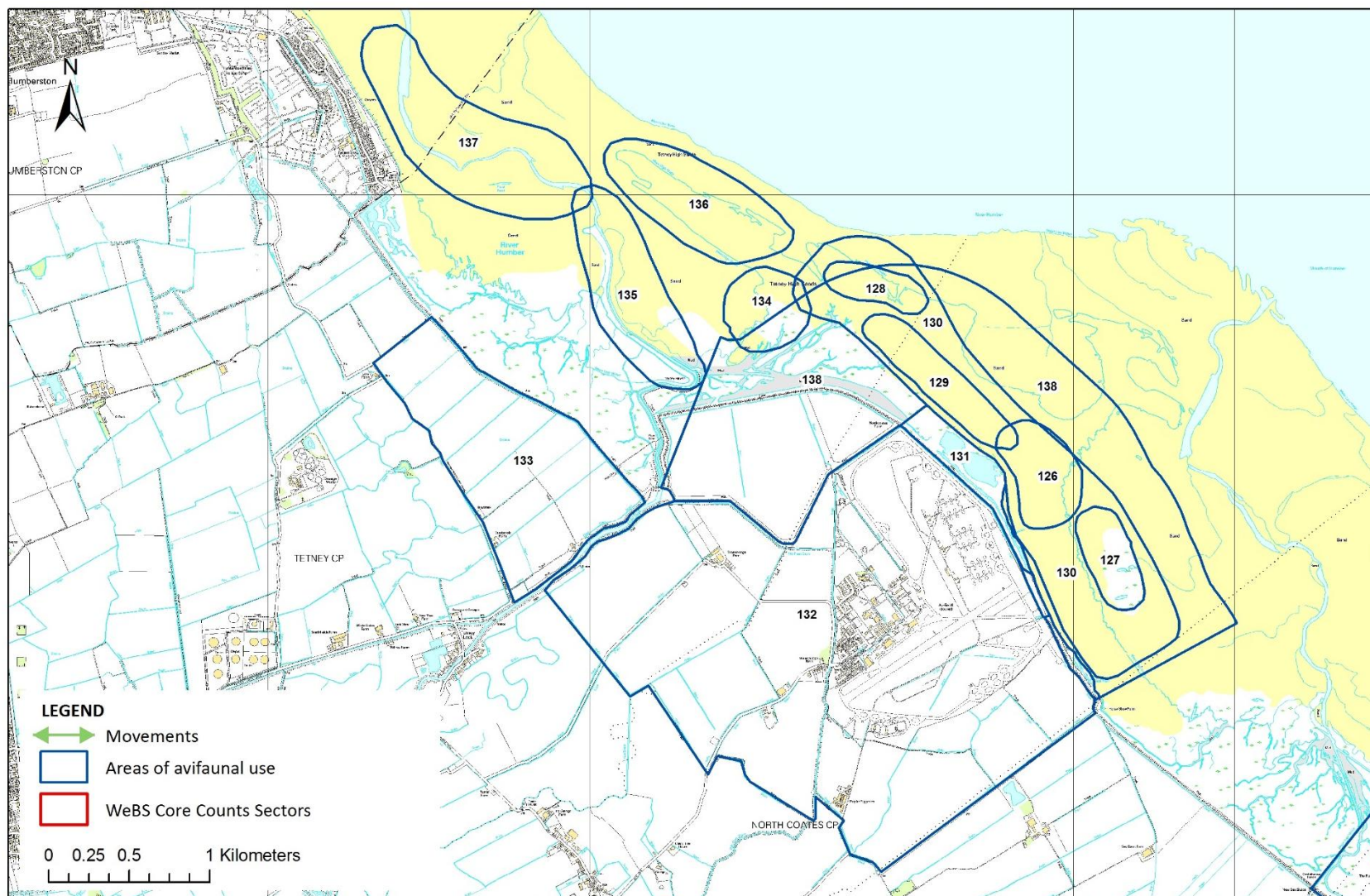
2.4.3 ADDITIONAL INFORMATION

Additional information on waterbird composition in the Grainthorpe Haven area is available as part of the cable landfall studies for the *Hornsea Project One* offshore wind farm. Smart Wind (2014) addresses aspects of the cable landfall on the ornithology of the Grainthorpe Haven area, identifying use of the upper shore by a number of wader species around high water including Dunlin, Knot, Grey Plover, Bar-tailed Godwit and Ringed Plover.

However, the data and text do not appear to differentiate usage types and thus it is not clear from the associated report whether these records are specifically for roosting birds or for continued foraging on some tides. However, the species and location data do appear to correlate to some of the consultee comments on roost utilisation in the area.



Map 4: Outer Estuary (South Bank) Roost Information



Map 4a: Outer Estuary (South Bank) Roost Information. Enlarged Tetney to Grainthorpe Area

Table 7: Consultee Target Notes for Map 4 Outer Estuary (South Bank)

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
126	Outer South	Can hold large numbers of Oystercatcher, Grey Plover, Knot, Bar-tailed Godwit and Dunlin.	OC, GV, KN, BA, DN	
127	Outer South	Important at high tides particularly for Oystercatcher (up to 2500), Bar-tailed Godwit (up to 700), Grey Plover (up to 800) and sometimes large numbers of Knot (10000).	OC, BA, GV, KN	
128	Outer South	Roost area on spring tides usually several 100 Oystercatchers, and lesser numbers of Knot, Dunlin etc.	OC (>100), KN, DN	
129	Outer South	Roost for spring passage of Sanderling and Ringed Plover.	SS, RP	
130	Outer South	Variable numbers of waders across the whole of this area on tides less than 7.8m.	WADERS spp inc. OC, KN, DN, BA, OC	
131	Outer South	Irregular night time roost for 1000s of Terns (mostly Common Tern) between Horseshoe Point and Northcoates Point during August and September.	T. (1000R)	
132	Outer South	Fields inland from Horseshoe Point to Tetney Haven can hold large numbers of Lapwing, Golden Plover and Brent Goose depending on cropping regime.	L., GP, BG	
133	Outer South	Fields from Fitties to Haven important for Brent Geese, Golden Plover and Lapwing.	BG, GP, L.	
134	Outer South	Grey plover, Knot, Bar-tailed Godwit, Dunlin and Knot on spring tides.	GV, KN, BA, DN, KN	
135	Outer South	Wildfowl, Teal, Wigeon, Brent Geese, and Shelduck along the haven.	WILDFOWL spp, WN, BG, SU	

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
136	Outer South	Whale back ridge can have good numbers of Oystercatchers, Sanderling and Knot etc.	OC, SS, KN	
137	Outer South	Area particularly important on rising and falling tides for all wader species and Brent Geese.	WADER spp, BG	
138	Outer South	Site usage (see detailed notes) - similar to 2005/2006. Area is of most importance at tides between 7.8m and 8.5m (Grimsby). Large movements of waders between Feeding at Spurn Blight and roosts at Tetney.	WADERS spp. (R)	
Additional Note Number	Area	Additional Information Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Source
There are no Additional Information Notes for this Section				

Table 8: Consultee Movement Notes for Map 4 Outer Estuary (South Bank)

Movement Number	Area	Species	Movement Description
There are no specific Consultee Movement Notes for the Outer Estuary (South Bank) but in target notes above, large movements of waders are noted between Spurn Bight (foraging) and Tetney (roosting). In addition, there is a regular exchange of Brent Geese between the Tetney area and Spurn/Kilnsea (M. Pilsworth pers. comm.)			

2.5 Outer Humber (Coastal)

2.5.1 AREA CONTEXT

The coastal south bank of the Humber includes areas that are effectively fully marine, with extensive areas of intertidal sand and muddy sand backed by marsh and grey dune. Several large creeks, together with dune, marsh and mid shore sandbank features create deltaic muddy pans with greater foraging function for many species of waterbirds.

There is a considerable area of coastal marsh and dune community fronting this reach, with arable agricultural land immediately in the hinterland, and little urban development. However, an MOD bombing range is present in the intertidal zone at Donna Nook, with this area also being used as an extensive Grey Seal (*Halichoerus grypus*) breeding colony during the winter months, with a correspondingly high visitor pressure along this section of the coast.

2.5.2 ROOST REVIEW FINDINGS

The consultation returns identified roost use in the Grainthorpe Haven to Donna Nook area to be primarily on the upper shore, but with TN 72 supporting 120 Curlew (Map 5). The upper shore area north of Donna Nook (TN 78) was identified as supporting flocks of up to 2,000 Golden Plover, 2,000 Lapwing, 450 Shelduck and 800 Dark-bellied Brent Goose, whilst Grainthorpe Haven marsh c. 2km to the north (TN 71) was identified as holding roosts of 2,500 Golden Plover, 1,500 Lapwing, 800 Knot, 150 Redshank and 250 Shelduck. Adjacent to TN 71, TN 76 (Map 5) identified the saltmarsh as being used by around 40 Little Egret (*Egretta garzetta*) and 170 Redshank.

Between Donna Nook and Saltfleet (e.g. TNs 73 & 74) the mid shore can be used by a number of species, including c. 270 Curlew, 50 Bar-tailed Godwit, 350 Dunlin and 500 Knot. A flock of up to 700 Dark-bellied Brent Geese use TN 68, moving up shore with the tide to TN 64 and TN 67. However, the most notable area in the mid shore of this section is TN 63 with records of usage by flocks of up to 1,000 Oystercatcher, 750 Dunlin, 6,000 Knot, 200 Ringed Plover and 250 Shelduck.

The consultation identified the Mablethorpe to Saltfleetby area as being used by a number of wader species, with Ringed Plover and Sanderling moving between TN 61 and TN 60 during autumn passage, and with a large gull roost mid shore (TN 59).

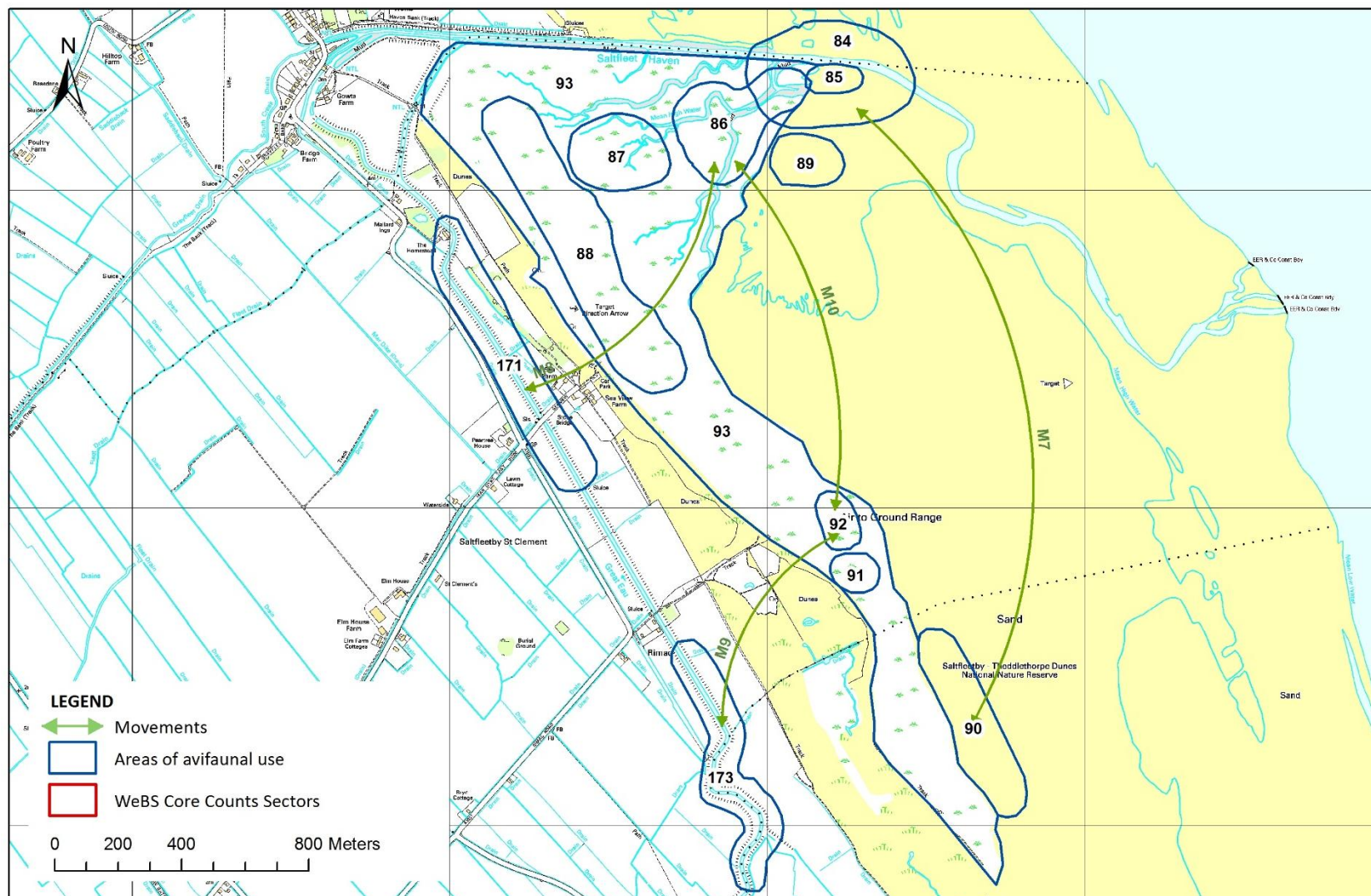
Around Saltfleet Haven (Map 5a) a series of roost/loaf areas are utilised in the saltmarsh by flocks of up to 250 Teal, 350 Wigeon, 50 Snipe, 100 Knot, 500 Curlew and 150 Redshank, with Pink-footed Geese using the adjacent fields in this general area. A seasonal lagoon (TN 92) supports a peak of 450 Curlew together with Whooper Swan (*Cygnus cygnus*) (20), Mallard (80) and Shoveler (*A. clypeata*) (35).

2.5.3 ADDITIONAL INFORMATION

No additional information covering this area for gap filling was identified.



Map 5: Outer Estuary (Coastal) Roost Information



Map 5a: Outer Estuary (Coastal) Roost Information. Enlarged Saltfleetby to Theddlethorpe Area

Table 9: Consultee Target Notes for Map 5 Outer Estuary (Coastal)

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
57	Outer Coastal	Curlew peak at 450 in winter. These move in with rising tide.	CU (450)	
58	Outer Coastal	In the winter Twite (TW) peak at 170, Snow Bunting peak at 200, Shore Lark peak at 16 and Carrion Crow peak at 250.	TW (170), SB (200), SX (16), C. (250)	
59	Outer Coastal	Black-headed Gull peak in August and September at c.7000, Common Gull peak at 8000 between October and December, Herring Gull peak at 2500 in winter (migration) and Great Black-backed Gull peak at 100 in winter.	BH (C7000), CM (8000), HG (2500), GB (100)	Dog walkers are a major disturbance to these roosts and horse riders and motorbikes are also occasionally causing disturbance.
60	Outer Coastal	Ringed Plover peak at 150 in spring, and Sanderling peak at 100 and Dunlin peak at 200 in later summer/autumn at migration.	RP (150), SS (100), DN (200)	
61	Outer Coastal	Ringed Plover peak at 150 in spring, and Sanderling peak at 100 and Dunlin peak at 200 in later summer/autumn at migration.	RP (150), SS (100), DN (200)	
62	Outer Coastal	Curlew 150.	CU (150)	
63	Outer Coastal	Oystercatcher peak at 1000, Dunlin peak at 750, Knot peak at 6000, Shelduck peak at 250, Ringed Plover peak at 200, Bar-tailed Godwit peak at 50 and Golden Plover peak at 50.	OC (1000), DN (750), KN (6000), SU (250), RP (200), BA (50), GP (50)	
64	Outer Coastal	Dark-bellied Brent Goose 350.	DB (350)	
65	Outer Coastal	Twite 100.	TW (100)	
66	Outer Coastal	Twite 100.	TW (100)	
67	Outer Coastal	Dark-bellied Brent Goose 350.	DB (350)	

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
68	Outer Coastal	Dark-bellied Brent Goose peak at 700.	DB (700)	
69	Outer Coastal	The saltmarsh supports winter feeding flocks of Skylark (500), Twite (120) and Rock Pipit (60).	S. (500), TW (120), RC (60)	
70	Outer Coastal	Twite 120.	TW (120)	
71	Outer Coastal	Redshank (120), Golden plover (2500), Lapwing (1500), Dark-bellied Brent Goose (500), Shelduck (250), Knot (800).	RK (120), GP (2500), L. (1500), DB (500), SU (250), KN (800)	
72	Outer Coastal	Curlew (120)	CU (120)	
73	Outer Coastal	Curlew (120)	CU (120)	
74	Outer Coastal	Bar-tailed godwit (50), Dunlin (350), Knot (500).	BA (50), DN (350), KN (500)	
75	Outer Coastal	Saltmarsh supports c.150 Skylark, 20 Rock Pipit, 25 Twite and 100 Linnet.	S. (C.150), RC (20), TW (25), LI (100)	
76	Outer Coastal	Little Egret (40) and Redshank (170).	ET (40), RK (170)	
77	Outer Coastal	Saltmarsh valuable for breeding Redshank.	RK (B)	
78	Outer Coastal	Golden Plover (2000), Lapwing (2000), Dark-bellied Brent Goose (800), Shelduck (450)	GP (2000), L. (2000), DB (800), SU (450)	
79	Outer Coastal	Snow Bunting peak at 400, Shore Lark peak at 20, Twite peak at 80 and Linnet peak at 150.	SB (400), SX (20), TW (80), LI (150)	
80	Outer Coastal	Lapwing (300) Roost.	L. (300R)	
81	Outer Coastal	Twite 130.	TW (130)	

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
82	Outer Coastal	Skylark (120), Rock Pipit (30).	S. (120), RC (30)	
83	Outer Coastal	Teal (600), Mallard (180) and Wigeon (120).	T. (600), MA (180), WN (120)	
84	Outer Coastal	Curlew peak at 250.	CU (250)	
85	Outer Coastal	Shelduck peak at 200.	SU (200)	
86	Outer Coastal	Teal peak at 250 and Wigeon peak at 350.	T. (250), WN (350)	
87	Outer Coastal	Snipe (20)	SN (20)	
88	Outer Coastal	Redshank (150) and Knot (100)	RK (150), KN (100)	
89	Outer Coastal	Lapwing (200), Ringed Plover peak at 100, Dunlin peak at 100, Oystercatcher (80), Bar-tailed Godwit (20), Grey Plover (25) and Knot (100).	L. (200), RP (100), DN (100), OC (80), BA (20), GV (25), KN (100)	
90	Outer Coastal	Curlew peak at 250	CU (250)	
91	Outer Coastal	Snipe (30)	SN (30)	
92	Outer Coastal	Seasonal lagoon supporting a peak of 450 Curlew in winter, occasional Whooper Swan (20), Mallard (80), Shoveler (35), Redshank (75)	CU (450), WS (20), MA (80), SV (35), RK (75)	
93	Outer Coastal	Saltmarsh supports a regular flock of c.500 Skylark, 100 Rock Pipit, 80 Linnet and raptor roost	S. (c.500), RC (100), LI (80)	Dog walkers cause disturbance along upper saltmarsh
173	Outer Coastal	No information provided but locations linked to TN 86 & TN 92 via MN 10 & MN 8	No additional information supplied	

Target Note Number	Area	Target Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Comments
171	Outer Coastal	No information provided but locations linked to TN 86 via MN 8	No additional information supplied	
Additional Note Number	Area	Additional Information Note	Usage Summary (F = Feed, R = Roost, L = Loaf)	Source
There are no Additional Information Notes for this Section				

Table 10: Consultee Movement Notes for Map 5 Outer Estuary (Coastal)

Movement Number	Area	Species	Movement Description
M7	Outer Coastal	CU	Curlew
M8	Outer Coastal	No info. supplied	No additional information supplied
M9	Outer Coastal	No info. supplied	No additional information supplied
M10	Outer Coastal	No info. supplied	No additional information supplied
M11	Outer Coastal	DB	Dark-bellied Brent goose
M12	Outer Coastal	DB	Dark-bellied Brent goose
M13	Outer Coastal	TW	Twite
M14	Outer Coastal	RP, SS, DN	Ringed Plover, Sanderling, Dunlin

4. DISCUSSION

4.1 Data and Coverage

As outlined in the introduction to this document, the agreed approach has been to utilise the sector specific expertise of the volunteer WeBS counters to identify key high tide roost sites, including inland areas.

However, it is emphasised that the WeBS methodology is primarily aimed at gathering data on waterbird usage at a wetland system level, e.g. an estuary, and whilst the data from the programme are often used at a WeBS sector level to assess waterbird usage, status and change, the methodology was not necessarily designed for this level of analysis rigor. In particular, there is no clear approach to characterising usage of inland areas by waterbirds e.g. for roosting and foraging, and therefore, it cannot be assumed that all WeBS count sectors routinely record use on adjacent inland fields, or that if they do, how far this coverage extends inland. As such, it is considered that the derived data from the exercise are good, but within the limitations of the WeBS methodology.

The consultation exercise produced a reasonable response in terms of area coverage and, in conjunction with information from other professional counters and a range of grey and published literature sources, it is therefore considered that the results of the exercise as presented are a fair representation of current knowledge on key roost areas around the estuary.

4.2 Change in Patterns or Levels of Use

As part of the consultation exercise, a request was made to consultees to describe any alterations in usage patterns or levels that they may have observed between the current assessment period and that of the early 2000s. This aspect of the data collection process was perhaps less successful with relatively few comments received, and it remains uncertain whether an absence of comment indicates no change in use levels or patterns or is simply an absence of sufficient information for the counter to expand upon. Indeed, it is fully acknowledged that the WeBS process does not require such a level of recording either in terms of function or historical comparison and as such, any information on potential changes over time is considered a bonus of the consultation exercise rather than a failing.

Although no detailed direct comparison in roost extent, composition, and level of utilisation between the two assessment periods has been undertaken as part of this review, there remain a number of areas that were identified as roost sites for some species in the mid-2000s that continue to deliver that function for the more recent reporting period. Indeed, the consultee response identified TN 101 as continuing to be used in a similar way to that described by Tasker and Milson in the late 1970s.

However, the consultation process did record a number of instances where a roost area was identified as having declined in use over time. Primarily, the cause for this decline was attributed to vegetation changes, and in particular, increased growth/sward height, e.g. TN 30. Improved drainage was also identified as having a potentially detrimental effect on roost use, e.g. TN 13 for Curlew.

However, primarily, alterations in use were attributed to crop height and type. Many of these comments were not necessarily linked to an absolute decline in use, but rather a

modification in use within the area depending on cropping (e.g. TN 37 & TN 38). Such a conclusion would appear reasonable although has implications for ongoing management of the estuary in terms of maintaining and/or enhancing roost potential.

Disturbance was identified as affecting roosts, although not necessarily causing a decline in take-up compared to the previous review period (see Section 4.3).

Given the apparent decline in the status of a number of key species across much of the estuary (e.g. Golden Plover and Lapwing) shown in Appendix 1, the absence of a large body of consultee response relating to roost status change is perhaps unexpected. However, as noted above, given that roost utilisation is not a primary recording aim of the WeBS process, the absence of many definitive comments relating to roost utilisation declines might be expected as an artefact of the wider WeBS process.

It is however interesting that for the most part, where declines have been recorded, these are ascribed to either vegetation growth, land drainage or changes in agricultural practice. Whilst components of such change cannot be readily managed (e.g. large scale vegetation change in the estuary), there is the potential for management of land use to address some aspects and, given the variation in roost take-up currently identified as a result of cropping, the potential for roost provision enhancements to be introduced.

4.3 Disturbance

As noted above, the consultation process included several responses that indicated that disturbance stimuli were affecting roost utilisation and potential, e.g. TN 108 and TN 59. Detailed disturbance sources and responses were not provided, but were primarily relating to public right of way access adjacent to the roost site e.g. walkers, dog walkers, horse riders and motor bikes.

It is emphasised that these responses do not represent a statistically robust disturbance cause and effect study, but do indicate the potential problem that disturbance can create, in particular one respondent for TN 109 commented that given the level of access and disturbance around this roost site, the continued use of the location potentially indicates an absence of any alternative, less disturbed roost sites.

The issue of public disturbance to high tide roosts certainly requires consideration when considering the wider management of the estuary. The relatively low number of respondent comments regarding this issue, whilst initially perhaps surprising, may simply be an artefact of a functional shift by waterbirds to less disturbed roost areas, e.g. whereby most habitual roosts sites are chosen because of an absence of disturbance, and as such, only where no alternatives are available, or that disturbance is more *ad hoc*, are the effects readily noted. Information gathering relating to waterbird disturbance responses from primarily recreational activity on the Humber has been undertaken in recent years by the Humber Nature Partnership (e.g. Ross & Liley, 2014), with a wider review of activities including construction work responses described by Cutts *et al.* (2009) and Environment Agency (2012).

4.4 Habitat Enhancement

Whilst many of the consultee comments were for aspects detrimentally affecting roost provision, there were some comments regarding new roost use from habitat enhancement. For instance, the managed realignment site at Paull Holme Strays was identified as

supporting several species of roosting waders, whilst the Kilnsea Wetlands (TN141) were noted as being used by a range of roosting and foraging birds including Golden Plover, Grey Plover, Knot, Redshank, Curlew and Oystercatcher. Although not specifically referred to in consultee responses, other realignment sites such as those at Welwick and Alkborough are also utilised as roosts on the estuary (N. Cutts pers. comm.; M. Pilsworth pers. comm.).

As such, there is evidence to indicate that new roost habitat can be successfully delivered on the Humber, and there is the potential for additional roost capacity to be designed into managed realignment sites and other habitat creation projects. In particular, given the potential difficulties in delivering sustainable mudflat habitat across all of a compensatory site, then the delivery of roost function in areas unsuitable for mudflat would be of value.

5. CONCLUSIONS

5.1 Methodology

Unfortunately, the data derived from the consultation process do not allow for any robust identification of areas that are **not** used as a roost resource. Although this aspect was requested where possible, as part of the consultation exercise, it is acknowledged that the WeBS methodology is not primarily aimed at covering terrestrial use of habitat and even identifying roost activity from that of foraging for WeBS core count sectors. Such a detailed examination of habitat function for key species within and adjacent to the estuary is therefore outwith the basic data collection remit for the WeBS core count process and thus it is not surprising that this level of detail was not provided in most responses.

However, data from the consultation process are considered to be good within the limitations of the WeBS methodology and have provided useful information on the current status of waterbird roost utilisation for sites around the Humber Estuary, with additional grey literature and other information sources adding to this snapshot of utilisation.

5.2 Important Roost Areas

The responses indicate that as with the initial review, the whole estuary provides roost site function and that patterns of use of these are complex in that they are affected by factors such as tide height and weather, as well as season and land use.

Intertidal mud and sandflats provide valuable roost function, particularly on neap tides, e.g. areas of Spurn Bight mid to upper shore together with some of the mid channel banks of the estuary, e.g. Whitton. Saltmarsh is also of value on all but large spring tides, e.g. Welwick.

Flood protection banks and other man-made structures also provide roost potential e.g. the derelict barge at Barrow Haven however, the report highlights the importance of fields adjacent to the estuary for roost provision.

These fields are perhaps of greatest roost value for a number of species. The field systems immediately behind the flood protection banks can be used by wildfowl such as Brent Goose and a range of waders including Curlew, Knot and Dunlin, but the most frequent and numerous utilisation tends to be by Golden Plover and Lapwing, which can be present in flocks well in excess of 1,000 individuals.

Golden Plover and Lapwing can habitually use a field as a roost/loaf site and flocks are often present in regionally and even nationally important numbers. This utilisation can extend some distance inland, e.g. over 1km from the estuary. Given the flock size and activity, such roosts can be susceptible to disturbance, both from predator incursion (e.g. raptor fly-throughs). However, other factors can influence such roost utilisation, including proximity and availability of inland foraging areas and *in situ* crop type and height.

5.3 Future Roost Review

Whilst it is considered that the information derived from this high tide roost review programme is of value, it is also the case that producing such a report, as a single exercise, every number of years can be a time consuming and resource intensive approach. It may be that a more efficient way of updating this sort of information would be to put in place a

more frequent, perhaps rolling, review system whereby individual location data are updated as and when information becomes available.

A more formal review process could be carried out by a small panel of experts on an annual basis or bi-annual basis, and in principle, there would be the potential for WeBS counter data to be incorporated into this process, perhaps via a modification to the on-line WeBS recording process.

Certainly it is considered that whilst there are areas of arable and grassland habitat around the estuary that will continue to support roost function over the longer term with little variation other than in relation to crop regime, there remains the potential for shifts in roost distribution and/or species usage to occur both in response to natural habitat changes on the estuary, but also resulting from habitat loss and gain through development and flood risk management.

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ANNEX 1: WATERBIRD STATUS CHANGES

As described in Section 1.2, analysis of WeBS 5 year annual mean maxima data has been performed for the periods 1999-2004 and 2007-2012.

It is emphasised that whilst it was not a primary aim of the project to provide bird population trend analysis, this analysis was carried out in order to provide context for the consultees and to encourage consideration and comment on any changes in usage which may have been observed, especially since the previous high tide roost mapping exercise carried out in 2006.

This analysis is therefore reproduced here as useful contextual information for interpretation of the main text. However, it should be noted that there have been some small scale alterations to the baseline data in recent years as and when the WeBS dataset is updated with additional information. These additional data can affect the sector totals and thus average peak maxima for some species, and in turn these may have some implications for sector status and change analysis for some species.

Furthermore, the extent of some WeBS count sectors has changed in recent years, for instance the Alkborough Sands sector has increased in size substantially with the development of new aquatic habitats behind the flood defences. In some cases then, a WeBS sector area may have increased substantially, but with no data within the WeBS dataset indicating this change. As such, the change analysis may be comparing differing survey areas and thus usage numbers for a few sites, e.g. potentially WeBS sectors adjacent to managed realignment sites.

The following therefore provide a useful indication of high level change for species and broad management areas of the estuary, rather than for specific WeBS sectors.

A1.1 Waterbird Community

Figure A1 provides a summary of population change for all WeBS sectors on the Humber and for all waterbirds. The Figure suggests that there has been a considerable reduction in waterbird numbers (e.g. a decrease of over 25%) on approximately 50% of the WeBS sectors, and an increase in excess of 25% on only 6 sectors for which comparable data are available.

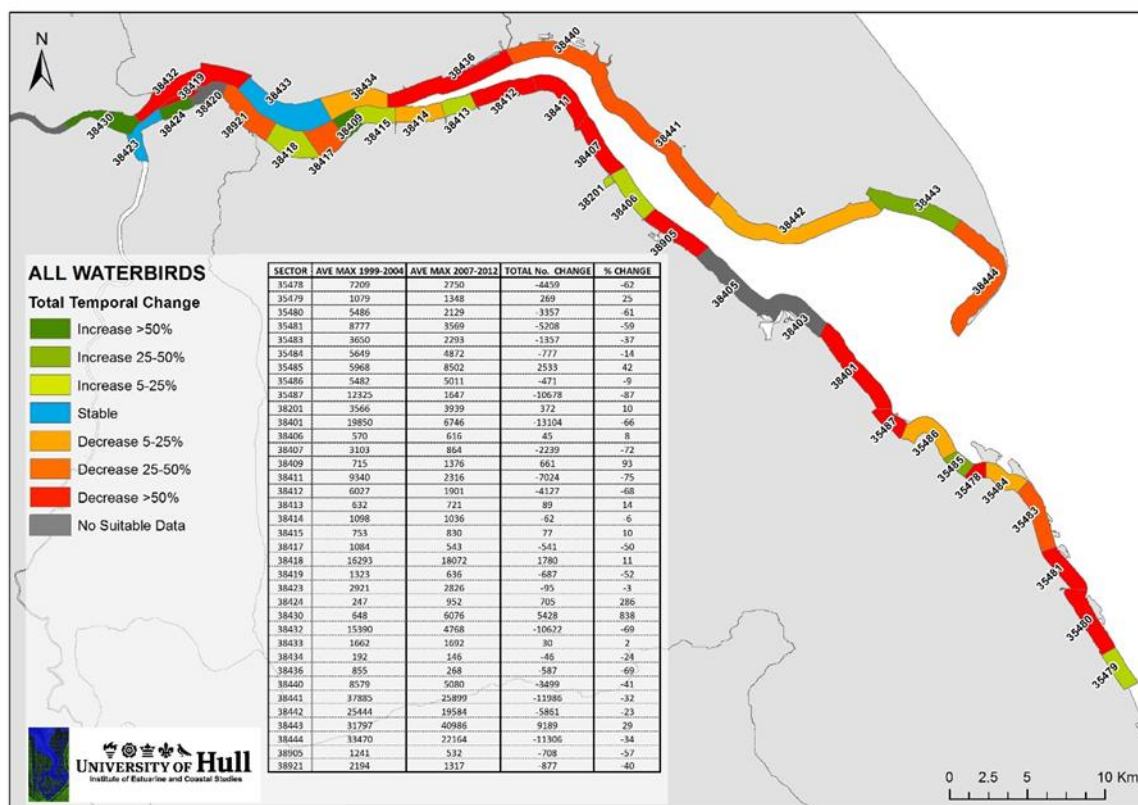


Figure A1: Population Change: All Waterbirds

There is little spatial pattern to the areas of reduction, with this occurring on both banks and from inner, middle and outer estuary sectors. Sectors having seen a decrease of over 50% in total waterbird numbers are:

35478, 35480, 35481, 35487, 38401, 38407, 38411, 38412, 38417, 38419, 38432, 38436 and 38905, with the greatest single decrease of 87% from sector 38487 on the south bank of the outer estuary.

The largest numerical reduction in 5 year annual mean values between the two analysis periods was in excess of 13,000 birds in sector 38401 in the outer estuary, with the adjacent sector 38407 recording a reduction of over 10,000 individuals. Additional reductions in excess of 10,000 birds were also recorded from sectors in the inner and middle estuary.

Increases in usage of over 50% have been recorded from sectors 38409, 38424 and 38430, the latter from the inner estuary featuring an increase of 838%. The greatest numerical

increase of over 9,000 individuals was recorded from sector 38443 in the outer estuary north bank, but with an increase of over 5,000 birds also recorded from the inner estuary.

However, given the potential for more abundant species such as Knot, Golden Plover and Lapwing to mask patterns of use by other species, an analysis of change for key species is of value to potentially identify more specific trends for species, areas or functions.

The following Annex section provides a series of population change maps for individual species, together with a short review text. The species selection covers most birds covered by counter responses described in the main report text.

A1.2 Pink-footed Goose

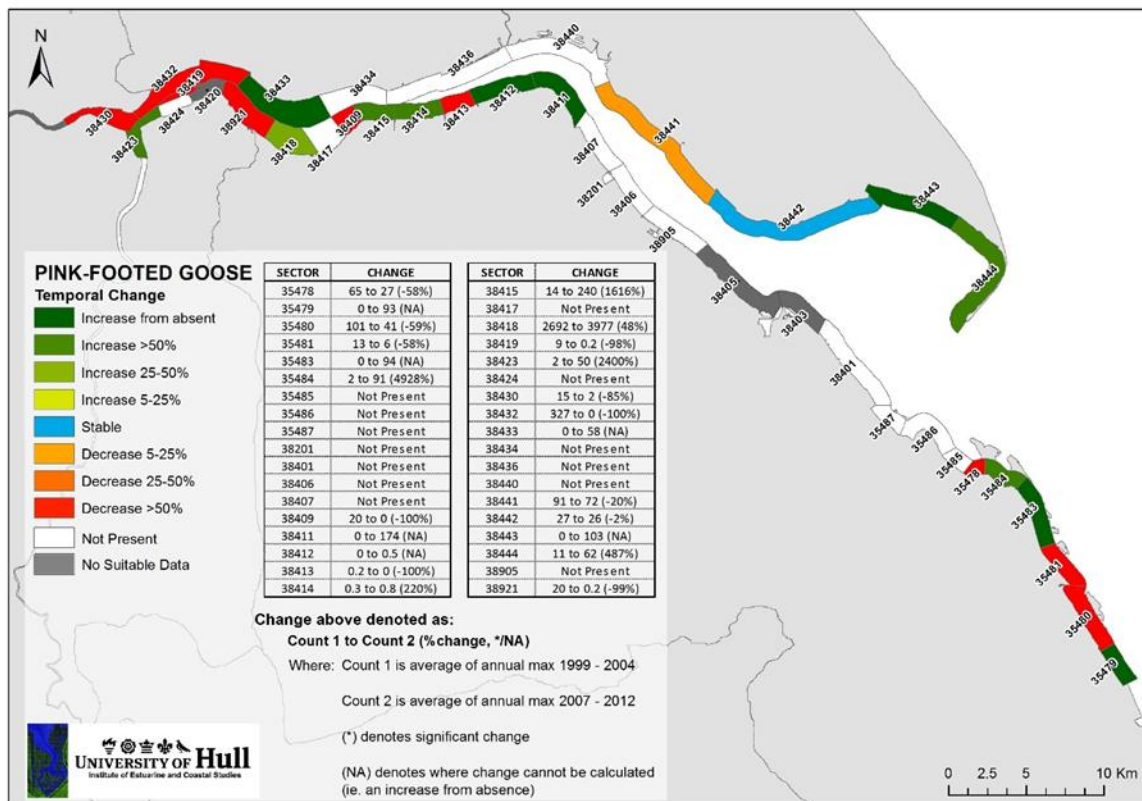


Figure A2: Population Change: Pink-footed Goose

Primarily a species of the inner estuary, the Pink-footed Goose has shown a decline in usage between the two analysis periods in this area. However, given the ecology of the species, including inland feeding and loafing activity, then small changes between sections are likely within the region.

In fact, the data indicate that a net increase has occurred for the species across the Humber, with an increase of over 1,500 birds on the main sector of importance (38418), and relatively small numerical, albeit large percentage reductions having occurred on adjacent areas.

A1.3 Greylag Goose

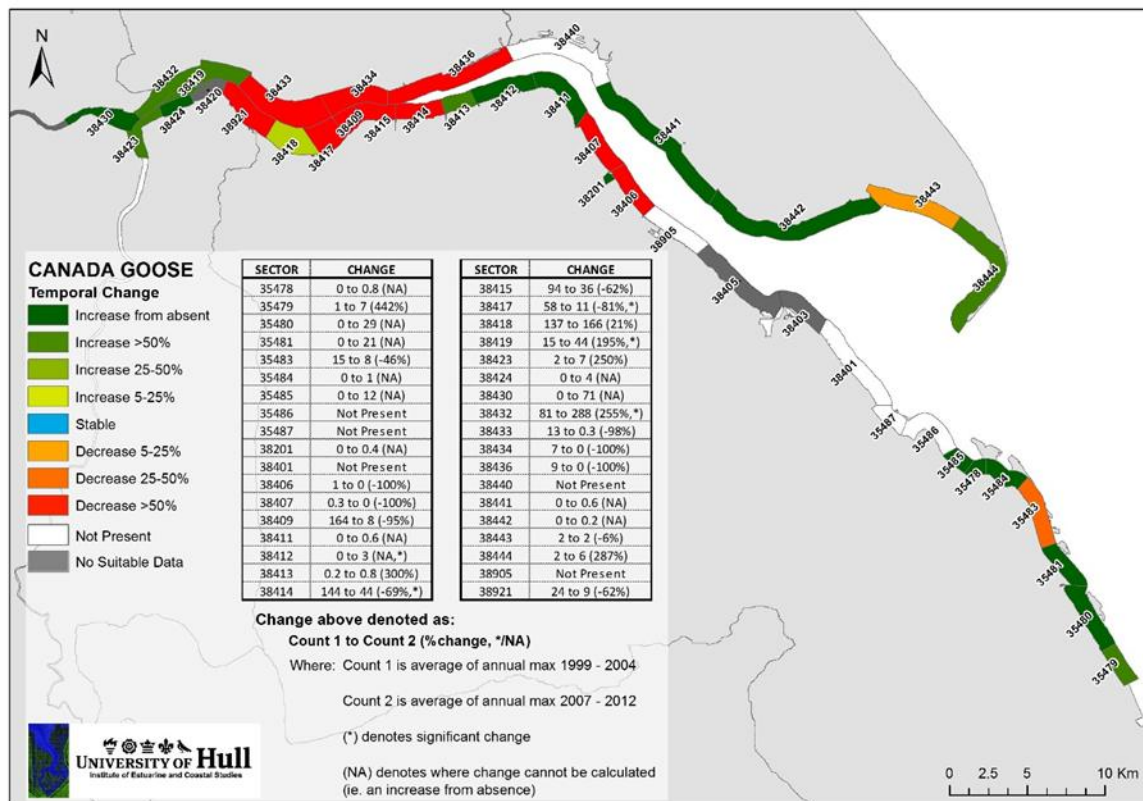


Figure A3: Population Change: Greylag Goose

The population of the species on the Humber has continued to increase, with the species resident in many areas of the estuary, and in particular, present in large numbers on the upper Humber where a breeding population is established on Whitton Sand.

A1.4 Canada Goose

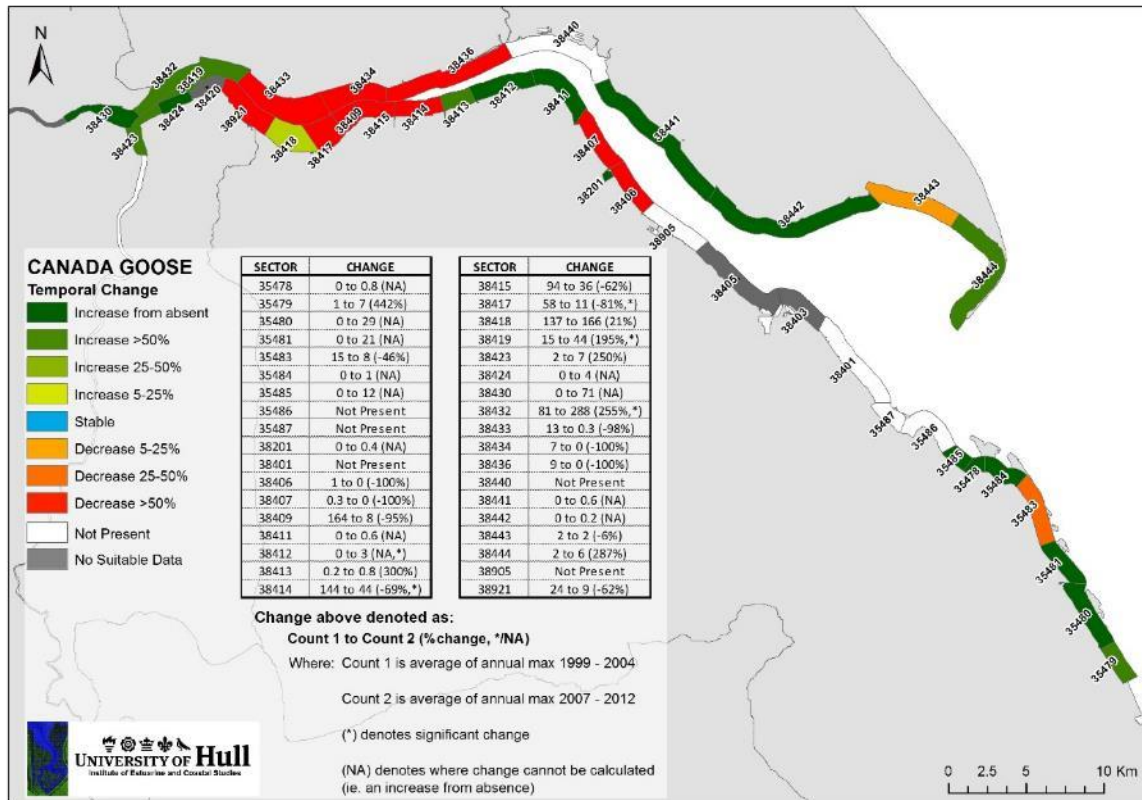


Figure A4: Population Change: Canada Goose

As with the Greylag, a large naturalised population is now present on the Humber, with vegetated areas of the upper estuary used in particular. However, the figure indicates that whilst some areas have seen a continued increase in numbers, this has not been uniform, with declines observed in a number of sectors, and the population across the estuary being relatively stable.

A1.5 Barnacle Goose

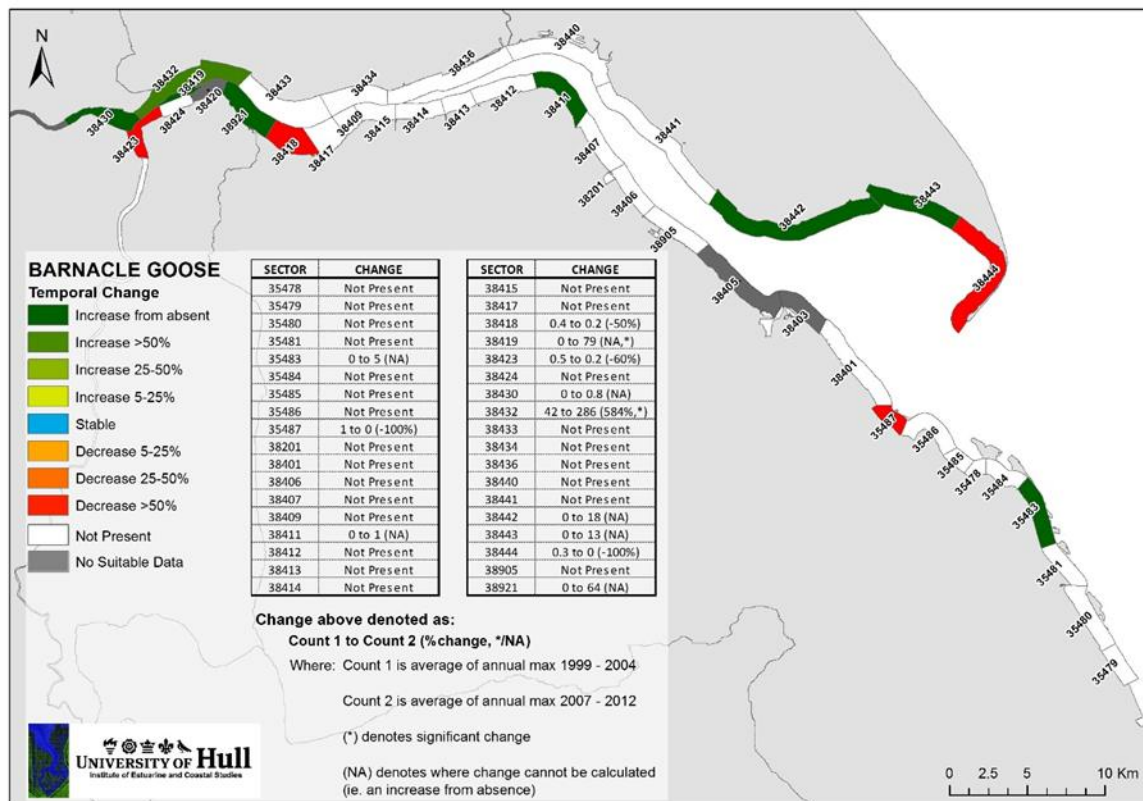


Figure A5: Population Change: Barnacle Goose

The species is less well distributed across the estuary compared to other naturalised species, but has a concentrated distribution on the upper estuary. This population has risen considerably in recent years from a few birds, and a large resident breeding flock is now present.

The increase in the status of the species in the outer estuary north bank is of some note, given that it could lead to a rapid expansion of the population as seen in the upper estuary.

A1.6 Brent Goose

Dark-bellied Brent Goose

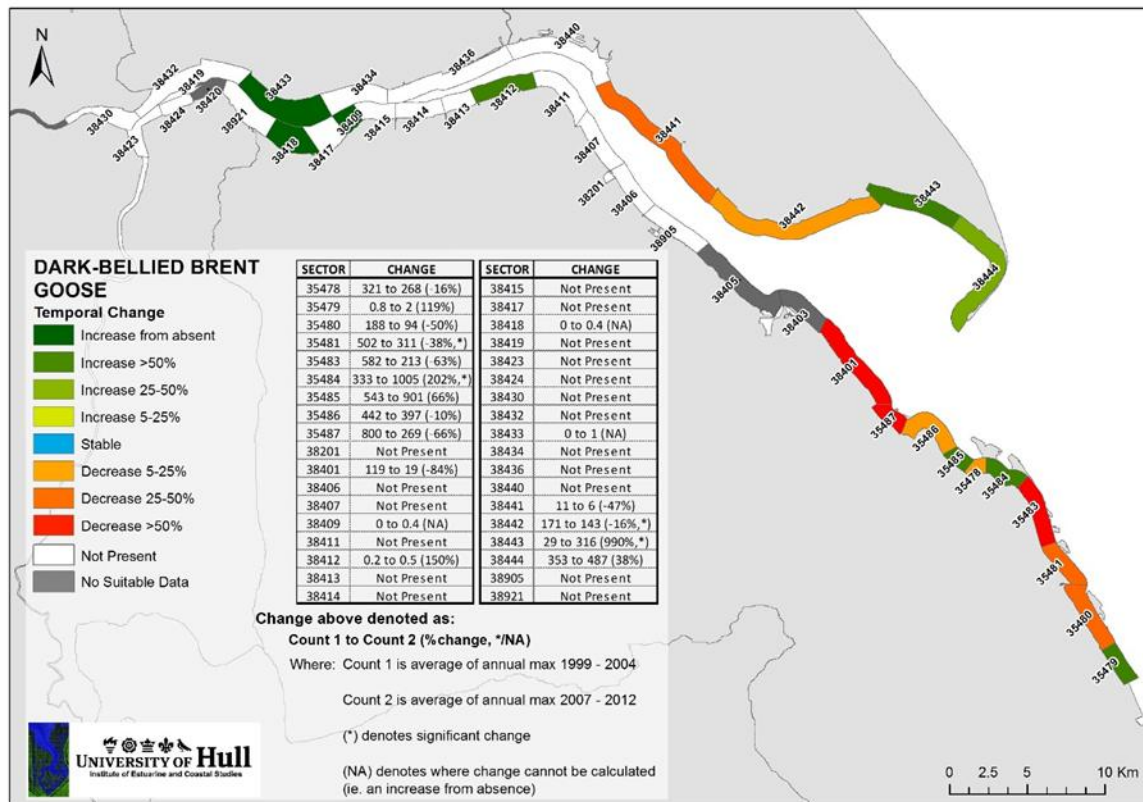


Figure A6: Population Change: Dark-bellied Brent Goose

There appears to have been a net gain in overall maxima across the periods, but with shifts in usage.

The species is primarily associated with the outer estuary and there would appear to have been a series of movements between sectors such that Spurn Bight has increased in importance and with similar shifts in the outer estuary south bank. Within the context of the Humber population, the increases in numbers seen from inner estuary sectors are of low importance.

Light-bellied Brent Goose

The Svalbard race is relatively uncommonly recorded on the Humber but its status has increased in the outer estuary (population change not mapped due to low numbers).

A1.7 Shelduck

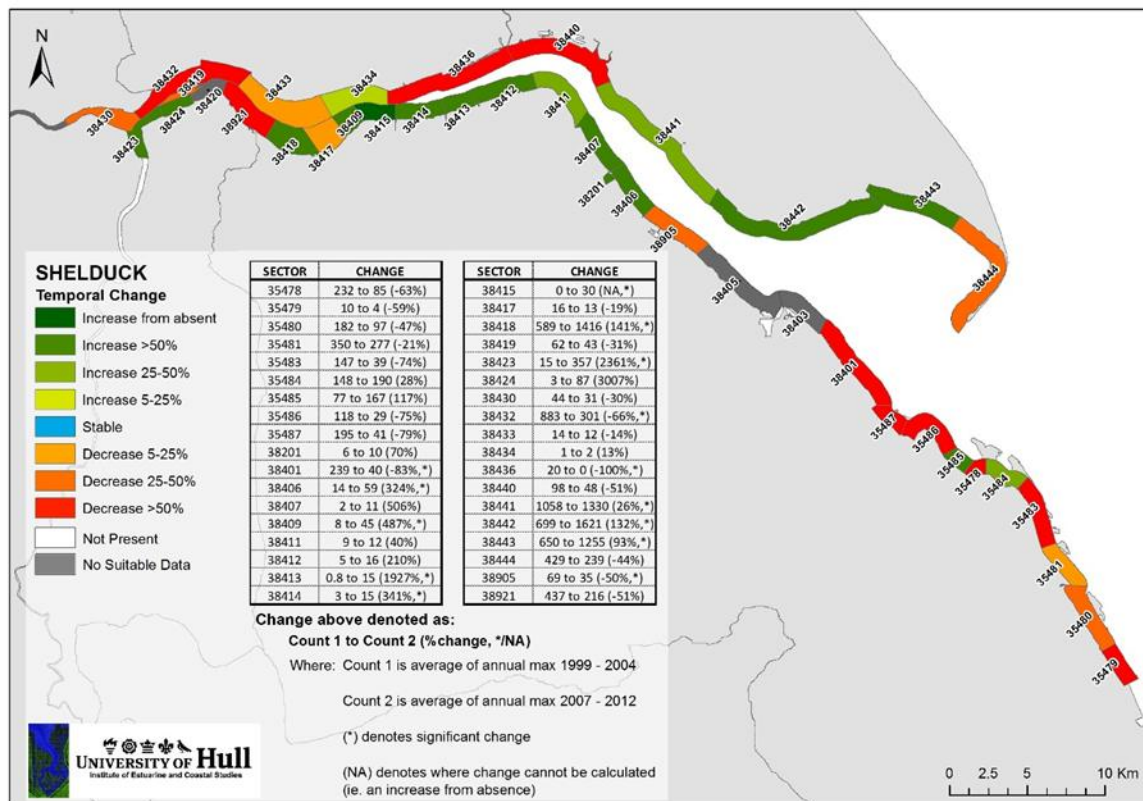


Figure A7: Population Change: Shelduck

From the figure it would appear that there has been considerable change to the importance of many count sectors for the species, with the inner and outer estuary still remaining of key importance but with shifts in use from north to south bank and *vice versa*.

There would appear to have been a considerable increase in the use of sectors 38441 to 38443 by c. 1,750 individuals, despite there being areas of vegetation growth on the intertidal area of parts of these sections.

A1.8 Wigeon

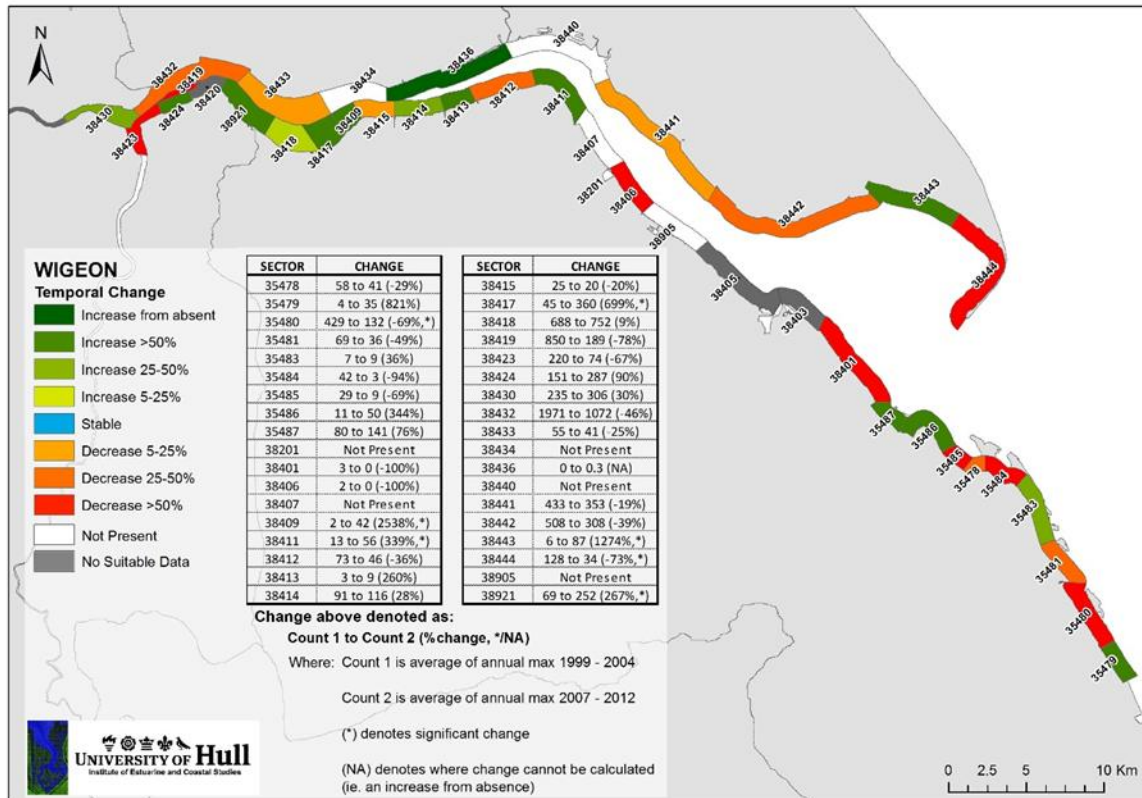


Figure A8: Population Change: Wigeon

The main area for the species (upper estuary north bank and Whitton Sand) has shown a reduction in usage by c. 1,500 individuals over the analysis periods.

There have been localised changes elsewhere in the estuary, but despite declines in numbers, the upper Humber remains the main area for the species.

A1.9 Mallard

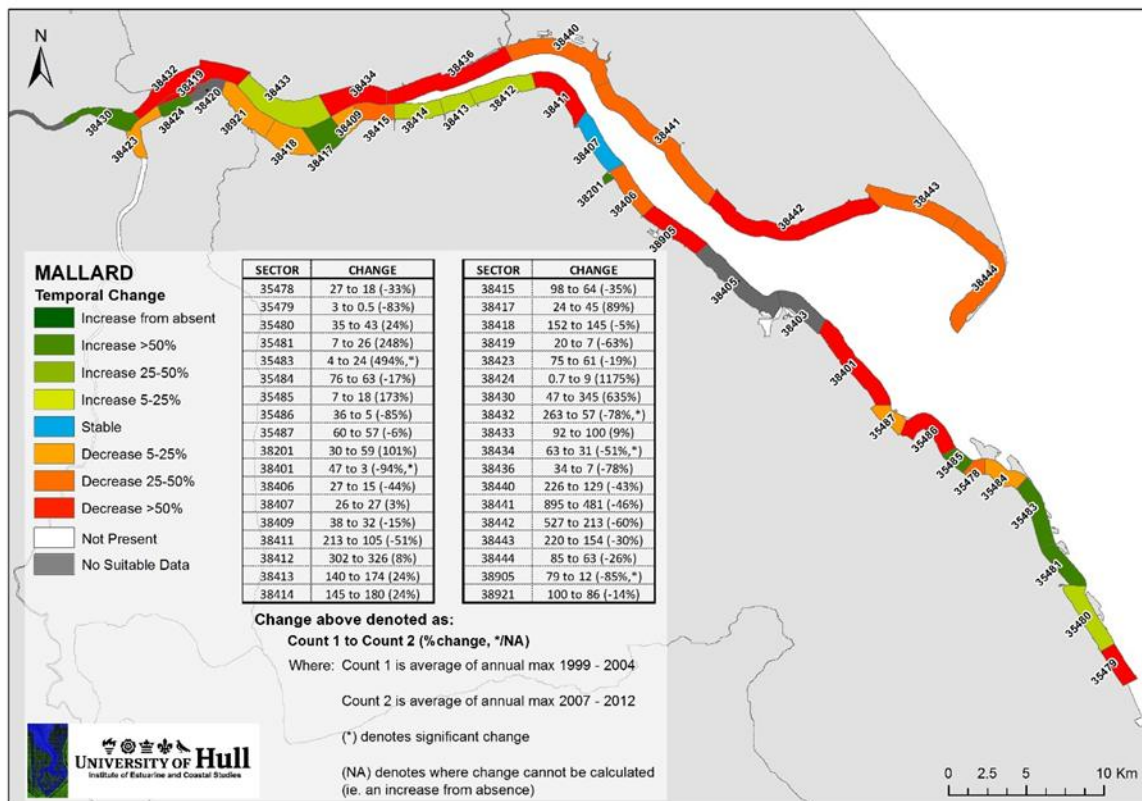


Figure A9: Population Change: Mallard

Historically, the inner estuary has supported the greatest numbers of Mallard, but this has declined in recent decades, with a shift in key area to the outer middle/outer estuary north bank. However, the figure shows that this area has seen a substantial reduction in numbers by approximately 900 individuals, and a reduction in the population from Hull to Spurn declining by around a half, although with a net reduction in numbers across the estuary.

The lower Ouse/Blacktoft Sands area has not followed this trend, with a considerable increase in the numbers recorded. Whether this is an artefact of recording variation between the analysis periods or an actual increase in the population here is uncertain.

A1.10 Avocet

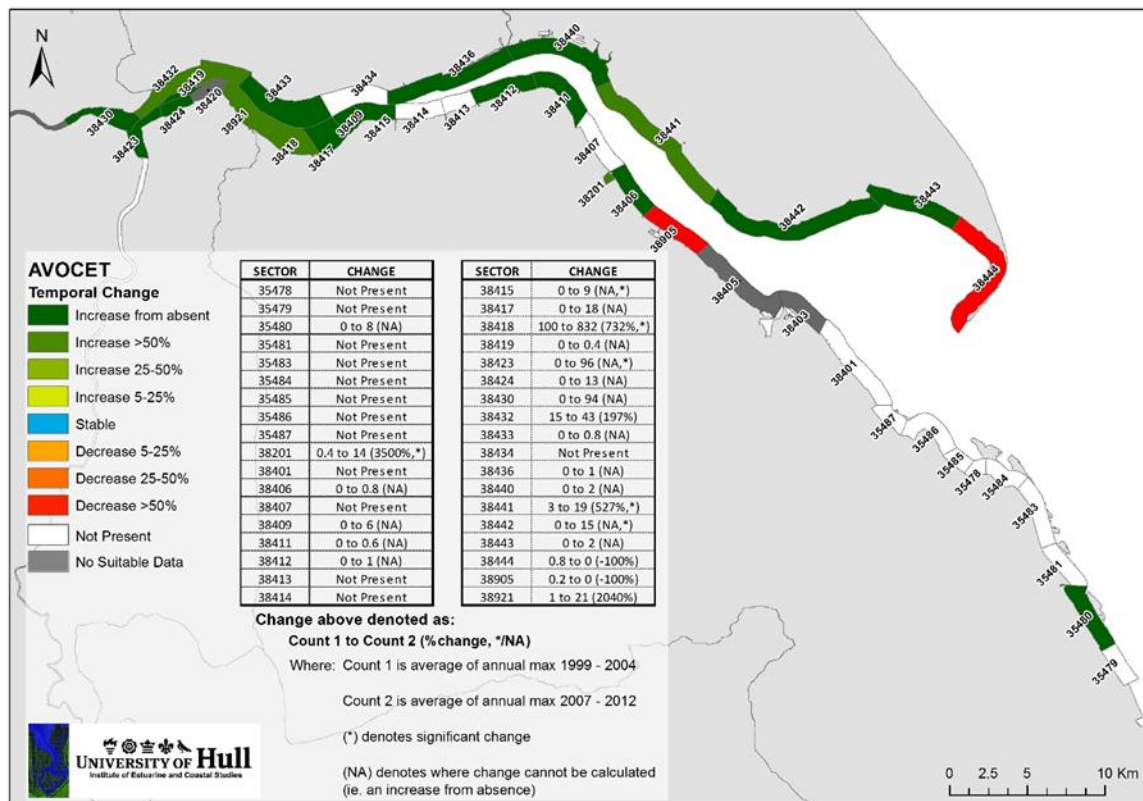


Figure A10: Population Change: Avocet

The species has undergone a range expansion in recent decades and has become an established breeder on the Humber.

Whilst usage tends to be concentrated around breeding sites, e.g. Read's Island and Blacktoft Sands, there is a pre and post breeding dispersal to adjacent sectors, with other breeding sites also being developed (e.g. Whitton Sand) as well as inland areas.

A1.11 Oystercatcher

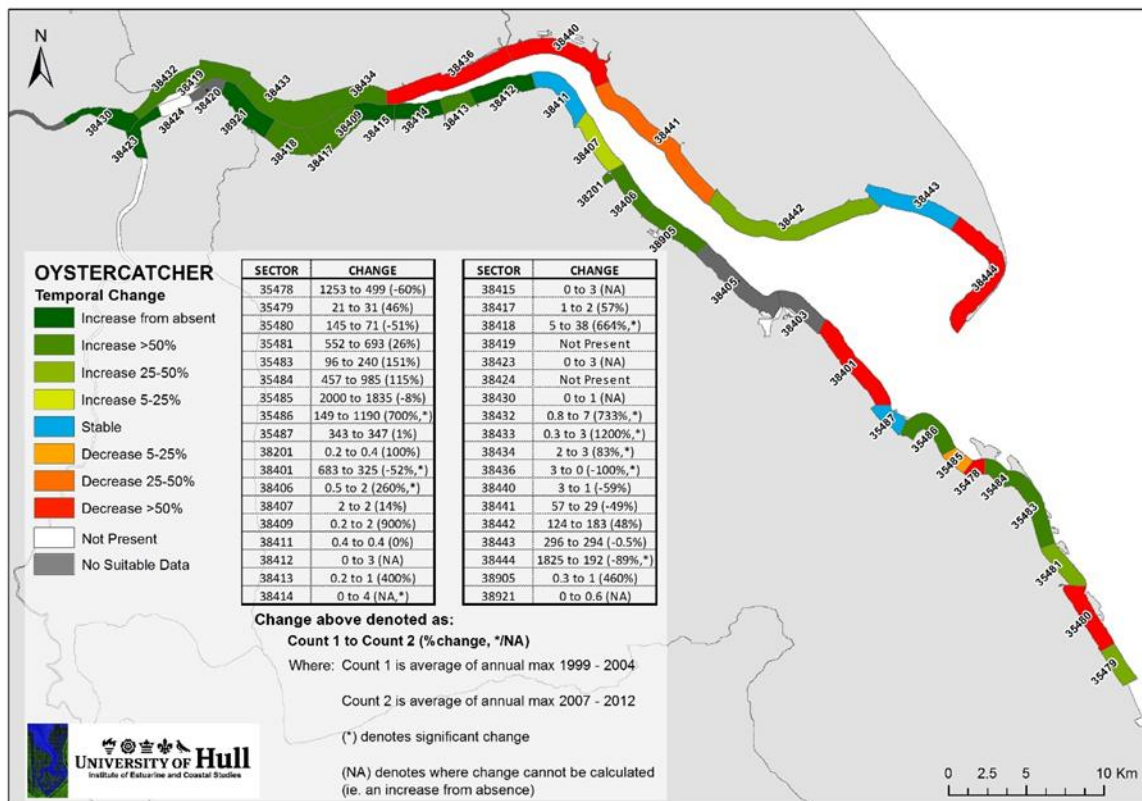


Figure A11: Population Change: Oystercatcher

Primarily a species of the outer estuary, there would appear to have been a reduction in numbers at the key sectors, with a decline of over 1,000 individuals recorded.

Whilst on the south bank it would seem that there has simply been a localised shift in the key sectors, there would appear to have been a net loss in use on the north bank in Spurn Bight (over 1,500 birds). The data suggest a possible shift in utilisation from this outer north bank area to the outer south bank with coastal sectors showing a net increase of over 1,000 birds albeit with some localised loss:gains between sectors.

A1.12 Golden Plover

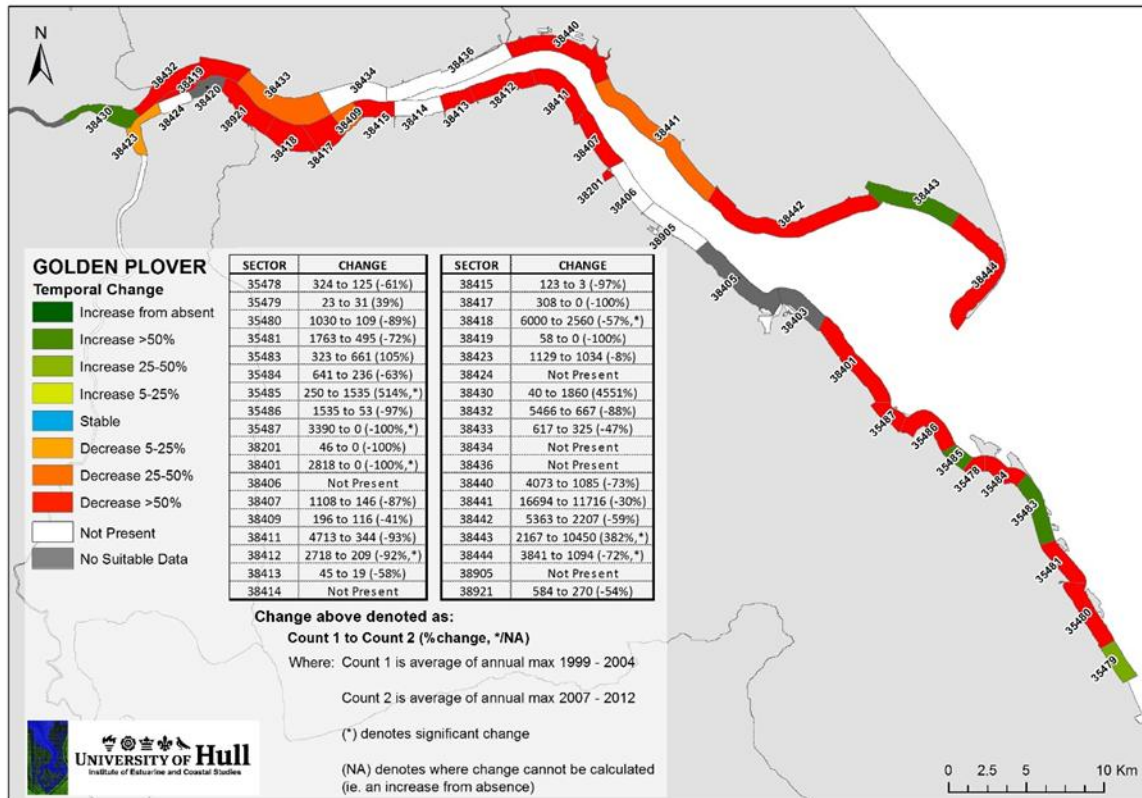


Figure A12: Population Change: Golden Plover

Apart from primarily the Welwick section on the north bank which has seen a considerable increase in usage by around 8,000 individuals, most key sectors for the species have undergone a decline in numbers between the two analysis periods.

A1.13 Grey Plover

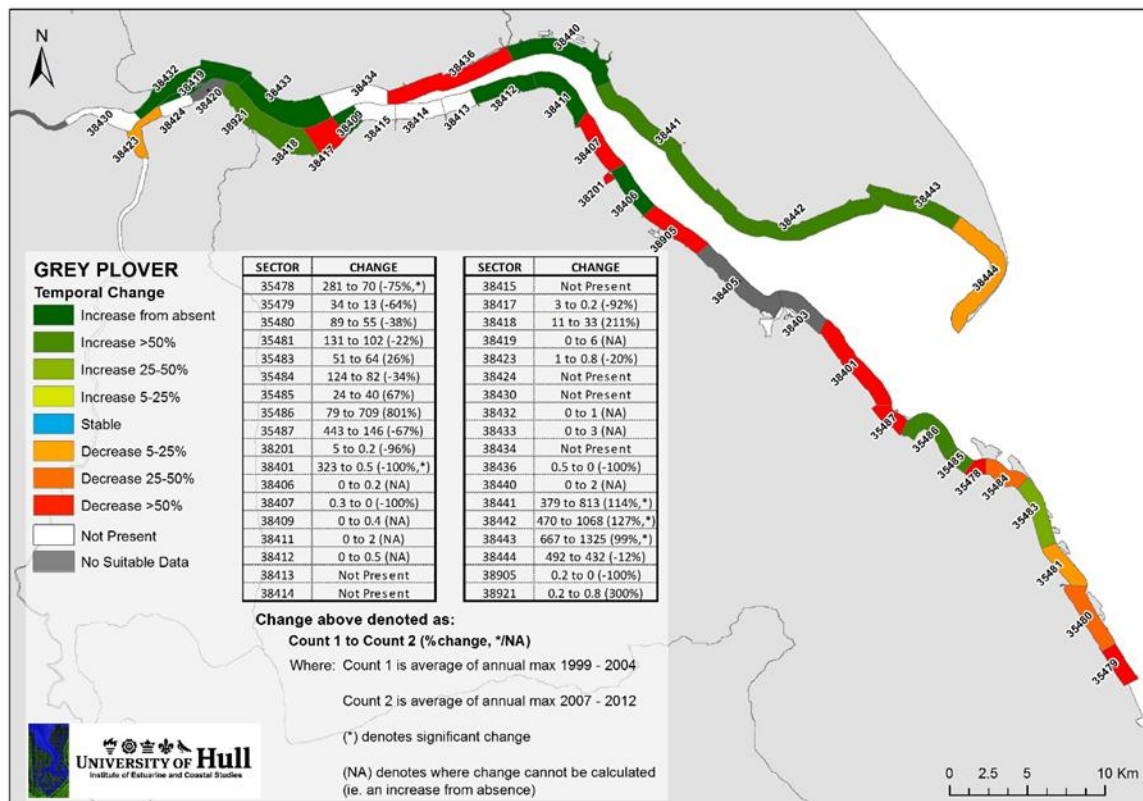


Figure A13: Population Change: Grey Plover

Primarily a species of the middle to outer estuary in terms of distribution on the Humber, there has been an increase in sector importance on the north bank middle estuary and a reduction in north and south bank outer utilisation.

A1.14 Lapwing

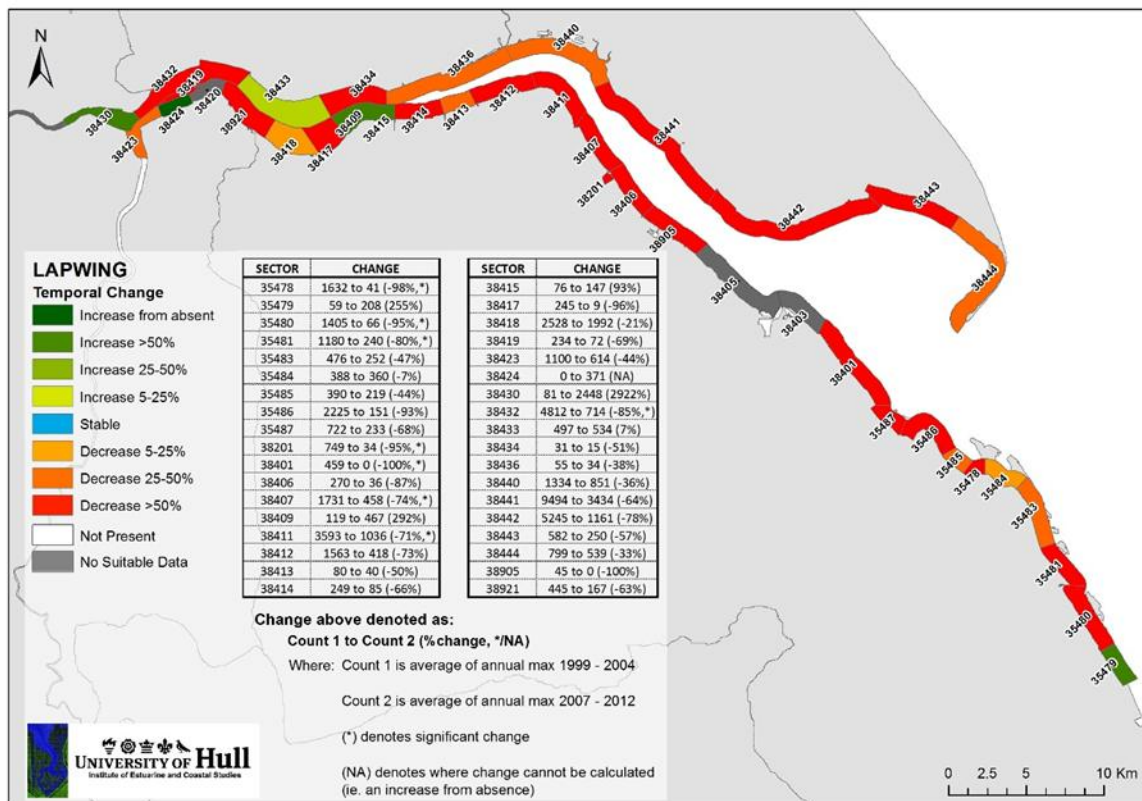


Figure A14: Population Change: Lapwing

The species is often associated with Golden Plover, both in fields adjacent to the estuary and on the intertidal mudflats used primarily as a loaf/roost when no inundated during daylight hours.

As with Golden Plover, the area around Blacktoft Sands has shown an increase in utilisation, although with a corresponding (if not greater) reduction in adjacent sectors. The middle and outer estuary (both banks) has shown a fairly consistent reduction with the reach from Hull to Spurn which has historically supported some of the largest concentrations of the species, seeing a reduction of over 10,000 individuals.

A1.15 Ringed Plover

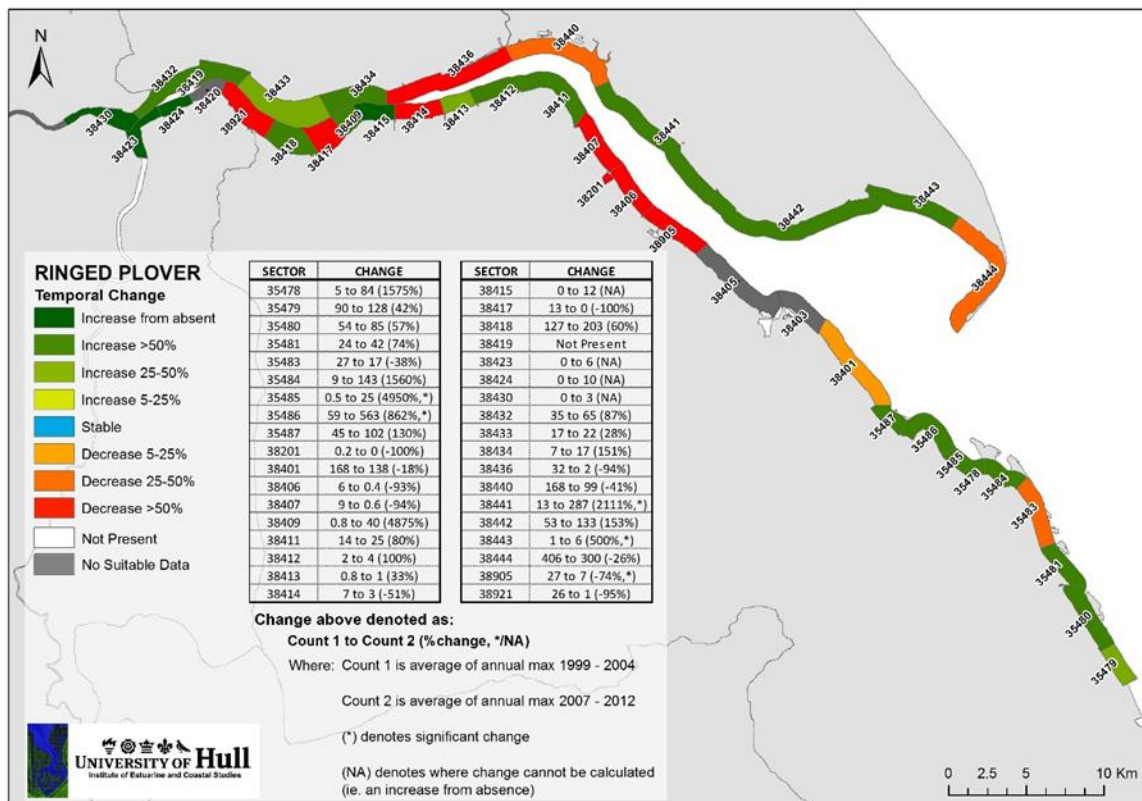


Figure A15: Population Change: Ringed Plover

The species tends to be present in greatest numbers in the outer estuary, but with some middle estuary sectors also being used by sizeable flocks. The figure indicates that whilst there have been reductions in usage in some sectors, these have largely been offset by increases on adjacent sectors.

A1.16 Curlew

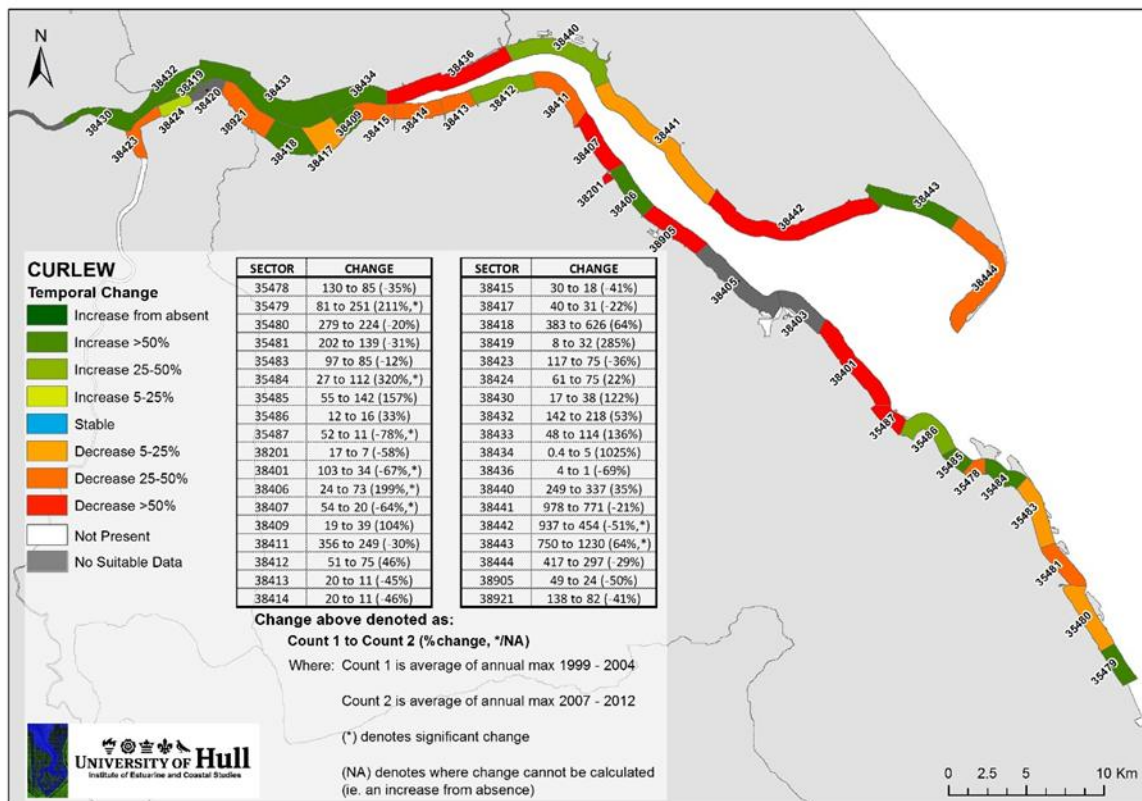


Figure A16: Population Change: Curlew

Interestingly, the shift between sectors 38443 and 38442 seen for Bar-tailed Godwit (see A1.18), is reversed for Curlew, although with Spurn again seeing a reduction in numbers. Elsewhere there is little pattern to change, although again the area around Read's Island has shown a large rise in use.

A1.17 Black-tailed Godwit

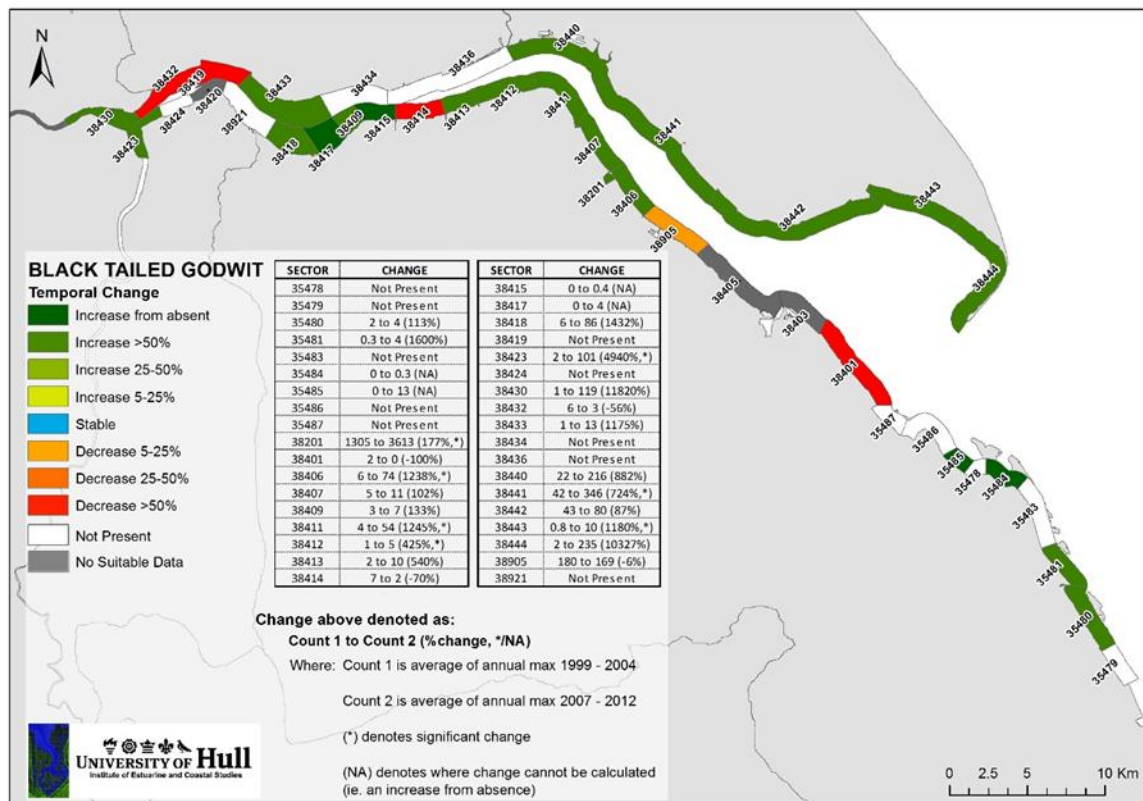


Figure A17: Population Change: Black-tailed Godwit

The species has increased in status on the Humber in recent decades and whilst initially fairly dynamic in sector utilisation, usage is now primarily centred around the roost on North Killingholme Pits, this area featuring an increase of over 2000 individuals between years. However, it is also noted that the sector including Paull Home Strays has also featured an increase in use post breach.

A1.18 Bar-tailed Godwit

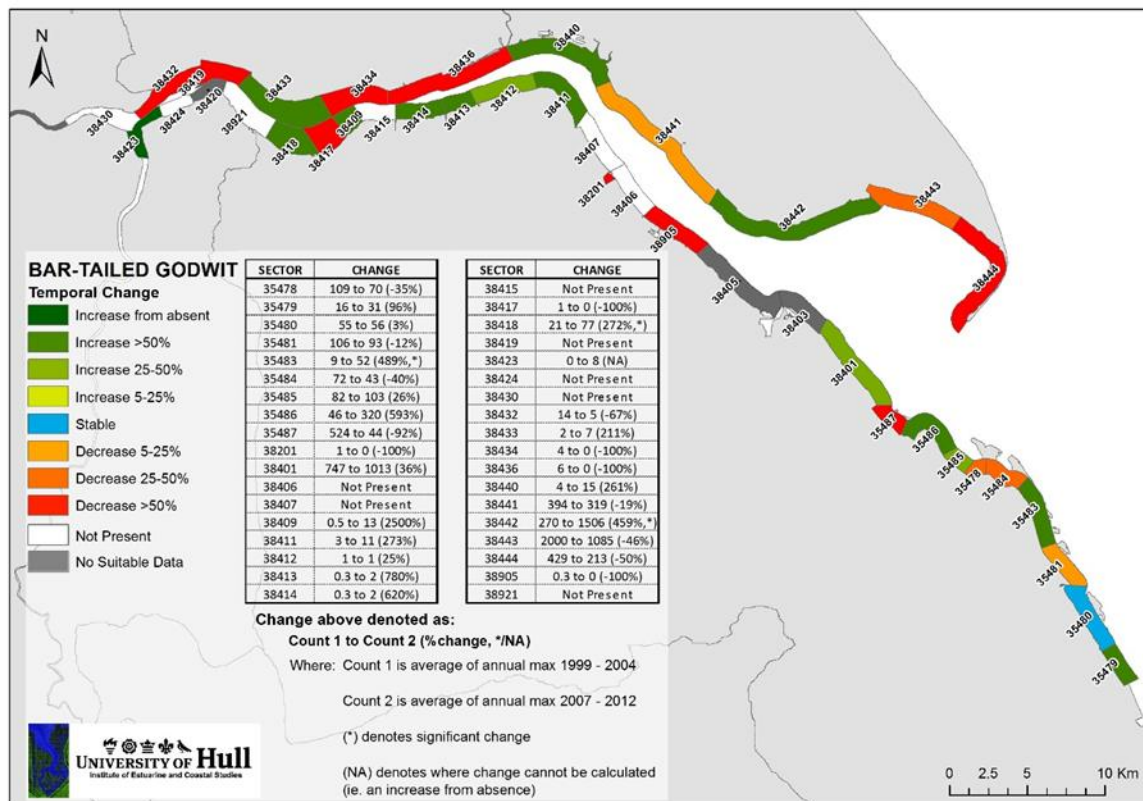


Figure A18: Population Change: Bar-tailed Godwit

A species present in greatest numbers in the outer middle to outer estuary, the figure indicates that there has been a shift in use from what was the core area east of Welwick, to the sector to the west. Spurn also saw a reduction, but with an increase on the opposite bank.

A1.19 Turnstone

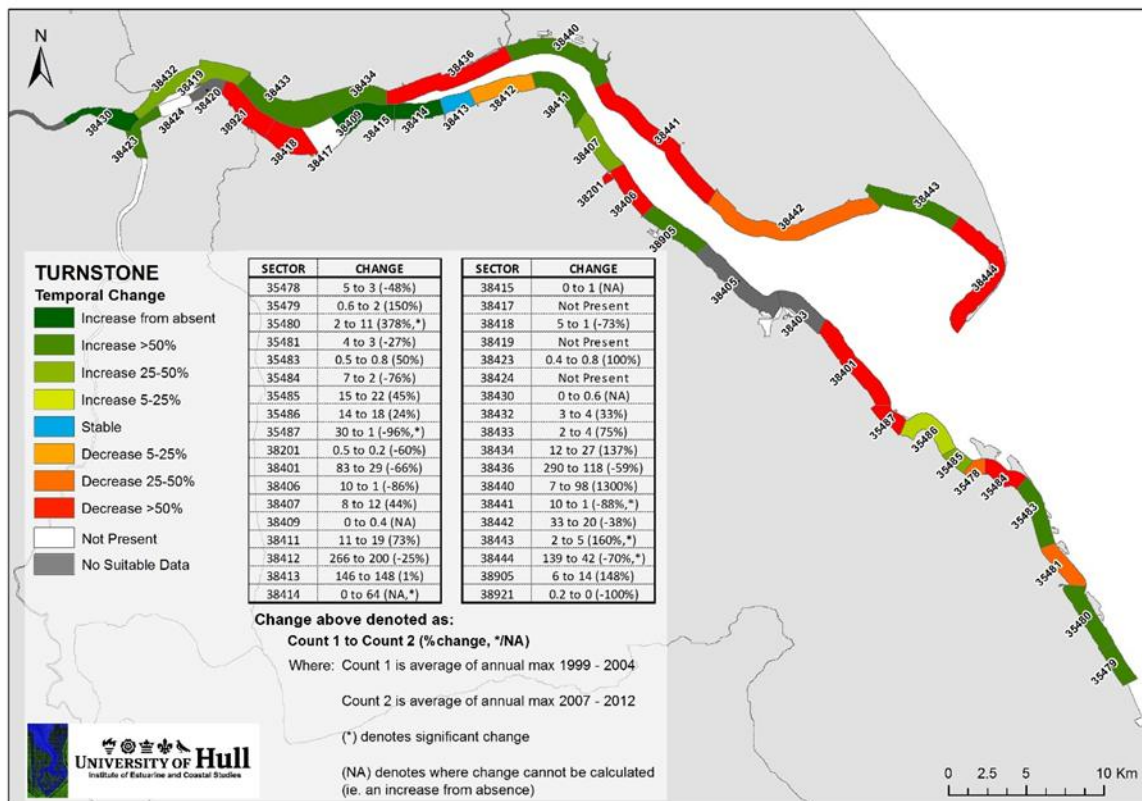


Figure A19: Population Change: Turnstone

Often associated with areas of harder substratum, whilst the figure indicates that there have been areas of loss and gain for the species, analysis of the data suggests that in the key sectors for the species, there has been a substantial reduction in numbers.

A1.20 Knot

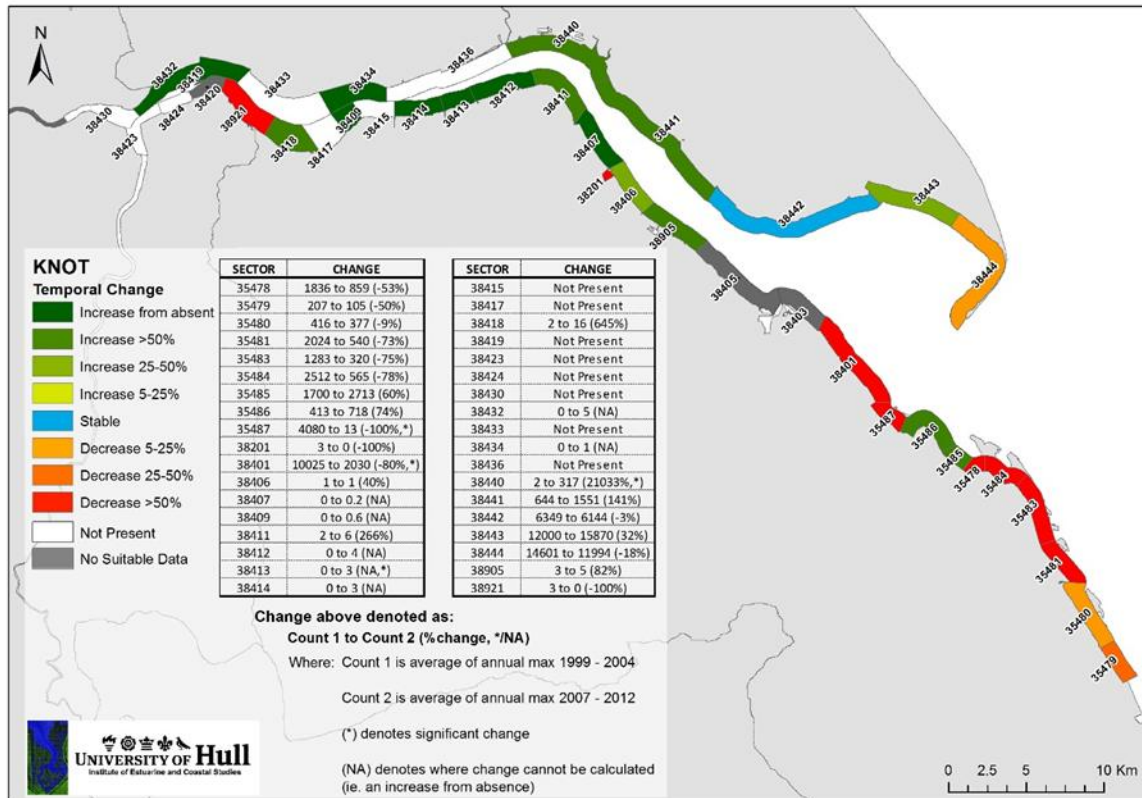


Figure A20: Population Change: Knot

The Knot tends to occur in large numbers in the outer estuary, and in particular, there have been records of very large flocks from the Lincolnshire coast and Spurn Bight. However, the figure indicates that there has been a reduction in flock sizes in many outer estuary areas, with an increase in usage being seen further into the estuary on both banks, although the data suggest that there has been a net loss in abundance of the species across the system as a whole.

A1.21 Ruff

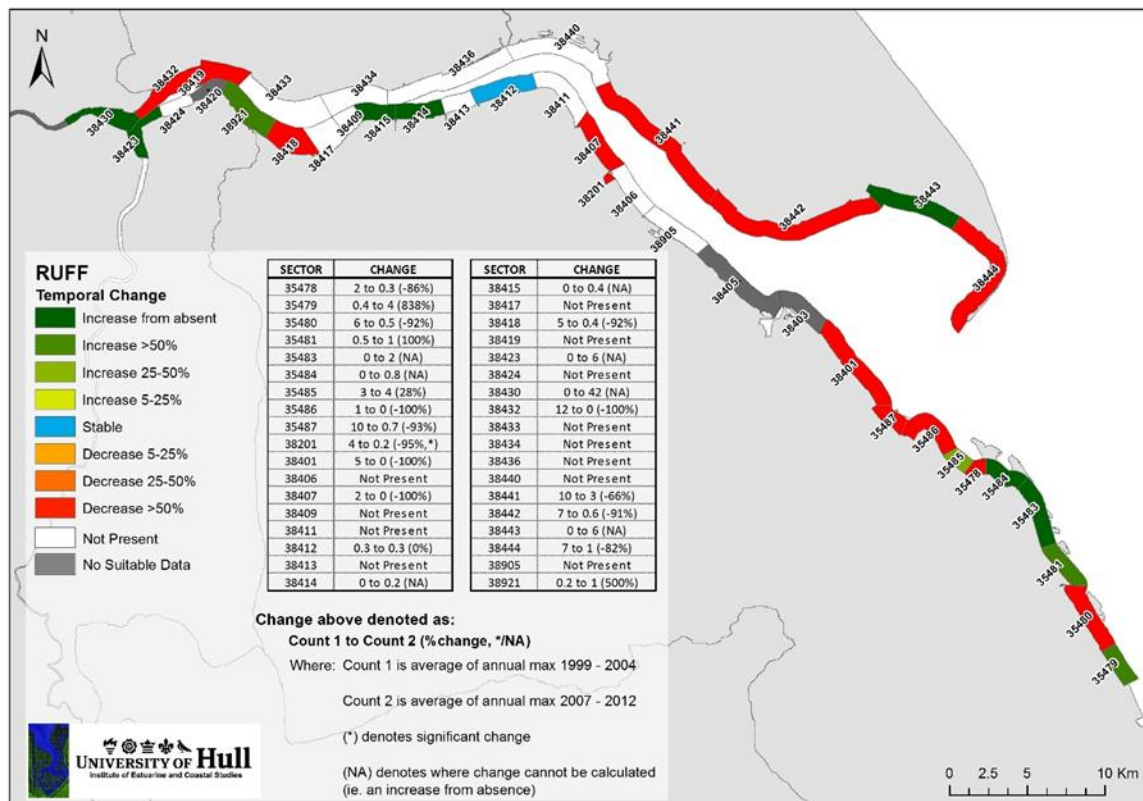


Figure A21: Population Change: Ruff

Only present in small numbers, changes in sector usage are probably of a low statistical and ecological significance.

A1.22 Sanderling

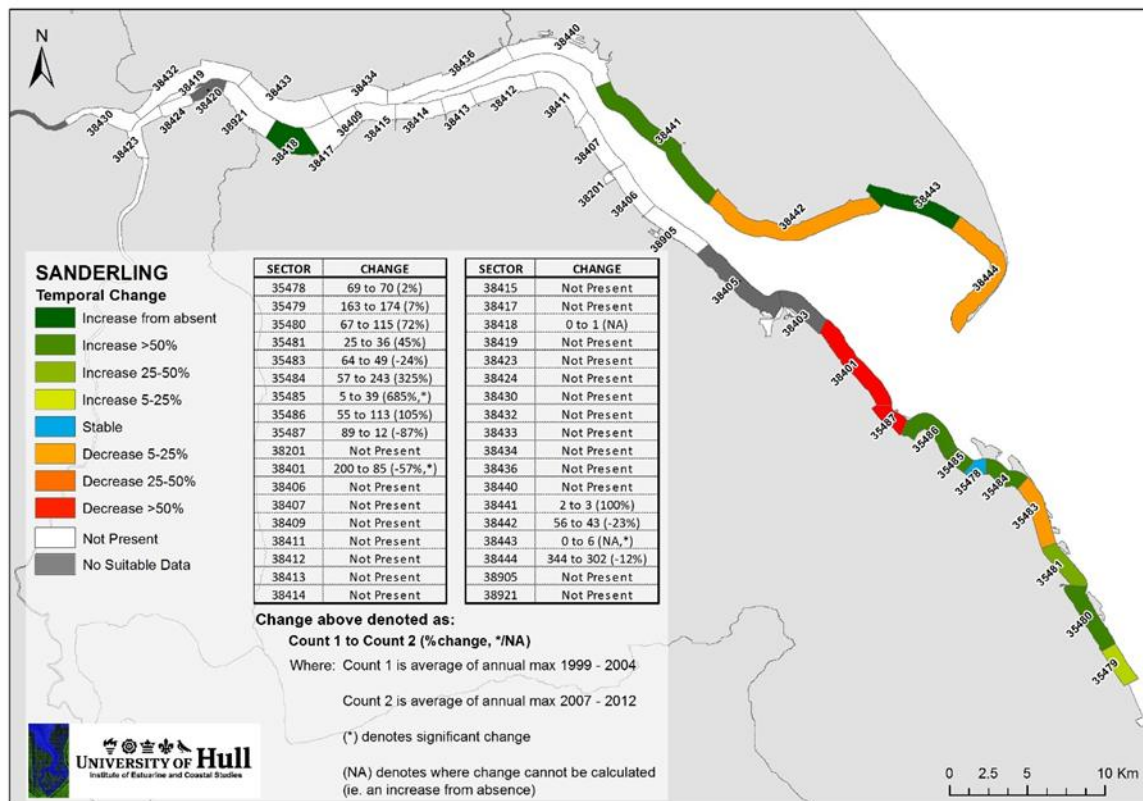


Figure A22: Population Change: Sanderling

A species with an outer estuary and coastal distribution, whilst abundance levels appear to have altered between sectors, overall numbers have remained relatively stable.

A1.23 Dunlin

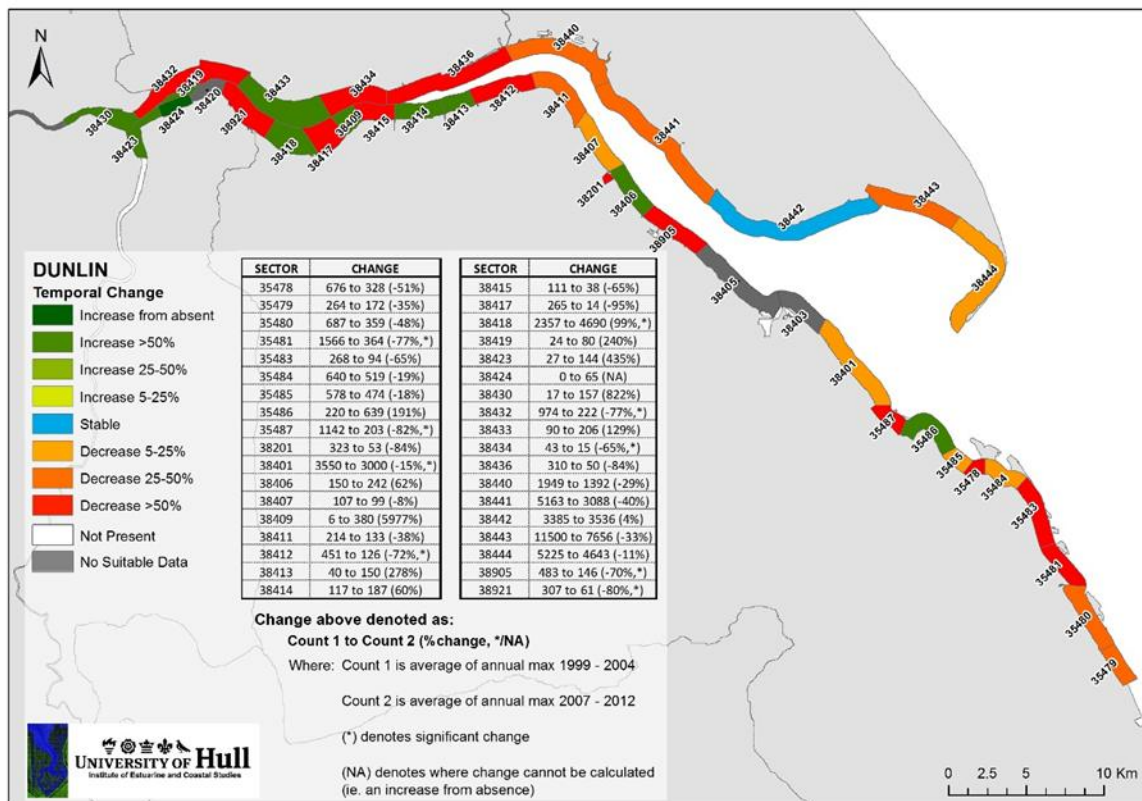


Figure A23: Population Change: Dunlin

A species characteristic of estuarine environments, declines have been noted at a national level. The figure shows that a general decline has also occurred on the Humber. The sectors where the species has been most abundant tend to be on the north bank middle to outer zone, where the loss, although less in percentage terms, has been greater numerically.

A1.24 Redshank

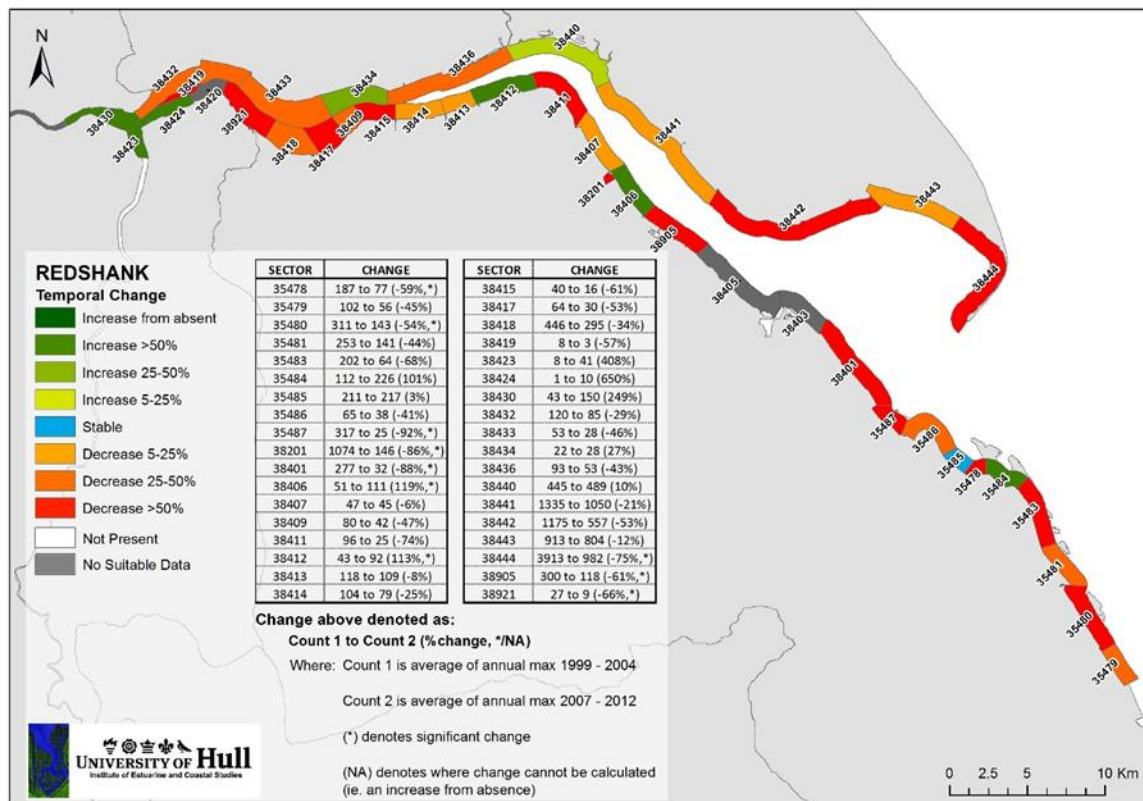


Figure A24: Population Change: Redshank

The above figure indicates that there has been a fairly significant decline in the status of the Redshank in most sectors between the two analysis periods, although in numerical terms, this is perhaps most of note in the outer estuary north bank, where the largest numbers have been recorded historically. In particular, the Spurn Bight sector has seen a loss of around 3,000 individuals between the periods, this sector previously having supported a considerable percentage of the Humber population of the species.

ANNEX 2: INFORMATION REQUEST PROVIDED TO WEBS COUNTERS AND OTHER CONTRIBUTORS

The WeBS consultation exercise utilised the following instructions with a mailing including several information documents and a blank map of the relevant count sector.

Humber High Tide Roost Review – Instructions Sheet

Introduction

The materials you will need to complete this consultation are:

- This instruction sheet
- The blank map of your WeBS sector
- The blank map of the estuary sector (inner, mid or outer) where your WeBS sector lies
- The copy of the previous high tide roost review map covering your WeBS sector
- The CD of data (and a computer to run it on!)
- Some pens!

Basically, we would like you to mark on the blank maps the patterns of high tide usage in your WeBS sector and any other areas of the estuary that you know well. We have provided the previous high tide roost review map and the CD of data to help inform your responses.

The maps on the CD are species by species analyses of the changes in the WeBS high tide counts. They show the percentage increase or decrease for each species, by sector, using the averaged counts from 2007-2012 compared to 1999-2004. The overall change for the estuary as a whole is also provided for each species. For the mathematically minded, statistically significant changes are highlighted (please don't worry if you're unsure what this means, it isn't crucial for this exercise!).

Marking the Maps

How you mark the maps is up to you – you may find it easier to work on the blank map if the situation has changed dramatically since the last review, or you might prefer to just mark any changes on the old map. We would though be very grateful if you could distinguish as clearly as possible between species, using labels, colours or separate markings (or any other means you prefer).

Some of the issues that we would like you to consider and try to illustrate or describe when marking up your maps include:

- Which areas are routinely used for high tide roosting and by which species?
- Which areas are used on a more ad hoc basis, but should still be considered as important?
- What species and numbers are involved in the roost sites?
- What flight routes do the birds take to the roost sites? Are there any clear patterns that you can illustrate?
- Which areas are never used?
- What are the effects of weather? Does severe weather such as freezing alter the roosting patterns?

- Are there any differences in roosting patterns across the different tide states? Can you differentiate between spring and neap tides?
- Are there any areas that are heavily disturbed, preventing roosting? Conversely, are there any undisturbed areas that birds particularly rely on?
- And finally, but importantly, **which areas do you not have very much knowledge of?** This may not seem as important as the points above, but will actually be vital during the analysis phase for determining whether an area with no markings is not used by birds, or is just an area of which you have little knowledge. Not having information for some inland areas fields/areas is to be expected, as the focus of WeBS is the estuary but highlighting areas of which you have little knowledge will not only help us identify areas not used for roosting, but may also help us identify areas where further investigation of roost use is needed.

We understand that this is potentially a daunting list of points to consider, but we are confident that this is information that most of you will already consider, even if just subconsciously!

Marking all of the above information on a small number of maps may well be quite challenging for some sectors. However, the focus of this review is changes in roosting patterns since the previous review was completed. So, if you are struggling to get all of the information marked clearly on the maps, then please focus on this issue of change. From that, we should then be able to piece together the overall picture for your sector. Similarly, if you feel you can explain certain aspects better in written or note form then please do so. In short, we would like any knowledge you can give us, in any way that you can, so please don't be shy!

Thank you once again for your assistance with this, it really is greatly appreciated. Please do contact me if you are struggling or have any questions.

Richard

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*On behalf of the Humber High Tide Roost Review 2013
Project Team from the RSPB, Natural England and the
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