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Humber Estuary wetland bird survey

Twelve months of high and low tide counts, September 1998 to August 1999 - Part 1

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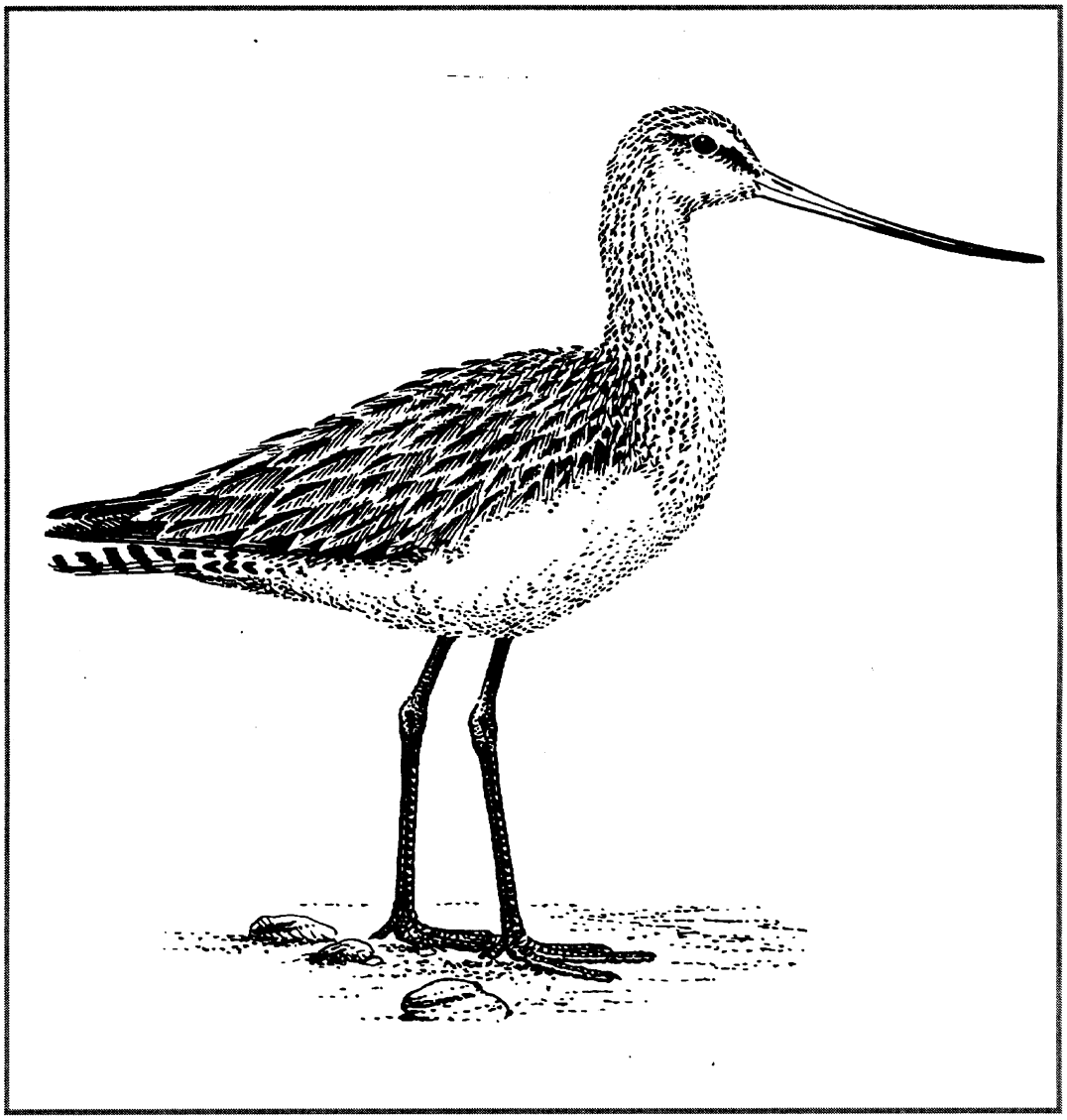

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Number 339

Humber Estuary Wetland Bird Survey
Twelve months of high and low tide counts September 1998 to August 1999

Part One

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Summary

1. This report presents the results of the first estuary-wide low tide bird counts of wildfowl and waders on the Humber. Inter tidal areas were covered from the M62 road bridge on the River Ouse, and Alkborough on the River Trent, to Spurn Point on the north bank and Grainthorpe Haven on the south bank. Wetland bird survey core count sectors were used with subdivision of the larger sectors. Counts were undertaken monthly from September 1998 to August 1999. Core counts were undertaken through this twelve month period, allowing comparisons between counting methods.

2. Part 1 presents summaries of each species. Detailed information is given for key species, including their distribution around the Humber Estuary, movement patterns, low tide and core count totals including core counts from previous years, and breeding information from 1999 where relevant. Notable peaks and important roost and feeing areas are also given, with much background information. These are followed by tables of the estuary low tide and core count totals by month and species.

3. Part 2 presents the low tide data in tables, by sector and subsector. This consists of count data, monthly proportions of the Humber totals for important species, and densities of the key species. Additional information is provided on count coverage, sector and subsector areas, peak densities by species and subsector/sector, and monthly core count data.

4. A comparison of low tide and high tide data shows consistent under-recording on the core counts (high tide) for ringed plover, golden plover, turnstone and bar-tailed godwit.

5. At low tide, ringed plover counts were a mean 36% higher than core counts. The core count winter peak (including the outer south shore) formed only 60% of the low tide peak despite the lack of low tide counts on the outer south shore. On the basis of this discrepancy ringed plover may be internationally important in winter in addition to the passage periods. The low water distribution indicates that whereas some areas are used by both wintering and passage birds, other are used only in winter or just by passage birds, with significance for conservation planning on the estuary.

6. The Humber is the only estuary in the UK with an internationally important populations of wintering golden plover. In this study the low tide peak was 36% higher than the core count peak in winter. Golden plover show significant movements around the estuary and away to terrestrial feeding areas. Core counts can miss flocks of birds that are feeding well to landward of the sea wall.

7. Bar-tailed godwits rely on a small number of feeding and roosting sites on the estuary. In winter, the low tide peak exceeded the core count peak by 204%, despite including core counts on the outer south shore sectors that were not included in the low tide counts. In fact, it exceeded the highest core count of the last 5 years by 22%. Either a lot of birds are being missed on core counts or they are moving out of the estuary at high tide. Due to their reliance on particular areas, any uncounted sectors can have major effect on the count total.

8. The turnstone core counts averaged on 60% of the low tide count totals, This is most likely the result of roost forming in areas where access for counters is difficult, on docks and piers, on lightships in mid-estuary and even inland (noted at Cleethorpes Country Park). Although not previously considered to be of national importance on the Humber, this discrepancy indicates that there may in fact be numbers of international importance.

9. Teal are another species best counted at low tide because at high tide they can be missed on Read's Island which is inaccessible and only observable from a distance at which identification is difficult. Cormorant numbers were also higher at low tide than on core counts but they are best counted at their roosts.

10. At New Holland Haven there is a terminal for grain and animal feeds. The spillage attracts large numbers of mute swans, mallard, redshank, turnstone and diving ducks (mostly pochard, tufted duck and goldeneye). The diving ducks feed on the falling tide and then drift downstream. This may have contributed greatly to the recent increases in the numbers of mute swans and turnstones on the estuary.

11. Shelduck were split between two major concentrations, in the upper Humber and downstream of Saltend, with apparently little interchange between the two except during migration. There is a large summer population on the upper estuary, including breeding and non-breeding birds and birds now remain on the Humber to moult, mostly in this area. The number of young birds on the estuary was counted.

12. Mallard have declined on the estuary in recent years, mirroring changes nationally. The release of captive-bred birds for shooting complicates the analysis of counts, but there has been a shift in their distribution in recent years, with a dramatic decrease on the Humber Wildfowl Refuge.

13. Included is an account of the rise of avocets breeding in the upper estuary following the digging of lagoons at Blacktoft Sands and Read's Island, and the increasing number of black-tailed godwits with a description of their movements in the estuary.

Contents

1. Introduction to the low tide project

With an impending review of the SPA areas on the Humber estuary, English Nature required information regarding the importance of the various inter tidal areas of the estuary as reflected in the bird usage of these areas. Information from the Wetland Bird Survey, with co-ordinated counts of waders and wildfowl conducted during the period of two hours either side of high tide, provided information on the roosting areas of wildfowl and waders but did not show their distribution over the inter tidal areas on the estuary. Under the chairmanship of Roger Morris (June 1998 to November 1998) and latterly Colin Newlands (December 1998 onwards) a steering committee comprising Andrew Grieve (RSPB warden Blacktoft Sands), Nick Cutts (North bank WeBS organiser) and Graham Catley (consultant ornithologist and south bank counter) was formed in May 1998 to oversee the organisation of the project. GPC was appointed on an EN contract to co-ordinate counts, process data, provide feedback to counters and produce the final report.

Early discussions between the steering committee and additional south bank WeBS organisers John Walker, Ian Shepherd and Keith Parker led to a decision to exclude the outer south bank WeBS sectors, from Pyes Hall (North Somercotes Haven) to Mablethorpe, from the proposed low tide counts. The decision was one of practicality based upon the simple lack of available manpower, which would have been needed to cover these extra sectors. By freeing counters from the outer south shore, in particular John Walker and Rob Lidstone-Scott, it was possible to achieve almost total low tide coverage of the important sectors between Humberston Fitties and Pyes Hall an area where coverage is usually stretched on WeBS counts.

In order to achieve some degree of comparability and to simplify the organisation of counter coverage a decision was made to use the boundaries of existing WeBS core count sectors and sub-sectors as the count limits for the low tide censuses with boundary lines projected out across the exposed inter tidal areas. For most sectors this proved a simple matter but in the upper estuary, where a rapid system of erosion and deposition has led to huge changes in the location of mud and sand banks, projecting the existent WeBS boundaries across offshore mudflats led to the splitting of what were in effect uniform feeding areas. Fortuitously in the case of the most obvious split mudflats, Inner South D and E1, waders and wildfowl were often clearly split between the two areas due to the increasing amount of coarse sand which is dominating the western end of the principal offshore flats.

Once proposals had been formulated all existing WeBS counters and various other ornithologists who had registered an interest in the project were contacted by mail in order that a list of available counters could be compiled and coverage organised. Response was good; the steering committee considered it advisable to consult as many of the counters as possible in order to address any queries regarding the project such as count methodology and data submissions. An informal introductory meeting was therefore organised in July 1998 at Far Ings visitor centre, where suitable facilities existed for presentation of introductory talks and the provision of refreshments over which further informal discussions could take place.

One of the main aims of the project with regard to counter satisfaction was considered to be the provision of regular feedback of results. This was to be accomplished through a regular, monthly, newsletter, which would include an analysis of the previous months count data and any available additional articles relating to the estuary. To achieve such a rapid turn round of data it was essential to have a reliable means of submission of count cards to the count

organiser, which was facilitated by the provision of pre paid-envelopes by EN. In the event the newsletter was produced and mailed to counters in all months prior to the subsequent count a phenomenal achievement on behalf of all concerned. Copies of the newsletters are available from the English Nature office in Wakefield.

2. Methodology

Existing WeBS sector and sub-sector boundaries were used as the basis for the count units. Some of the larger sectors were however, further split into new sub-sectors for the purposes of the low tide counts. Boundary lines were projected out across inter-tidal areas or followed larger features such as tidal creeks where appropriate; Grid references for all sectors and sub-sectors are given in Appendix I.

Counts were undertaken in each of the twelve consecutive months from September 1998 to August 1999. With the exception of one month, January 1999, all of the low tide counts were undertaken on the same date as the main WeBS high tide core counts. In this case, counts were taken on successive weekends. With the extensive differences between tide times at the head of the estuary and the mouth combined with the reduced hours of daylight during the winter period there were obvious difficulties in undertaking high and low tide counts on the same day between November and February inclusive. Fortunately the predetermined WeBS dates for the most part allowed two counts on most of the estuary during the mid winter period but in some instances low tide counts were taken in the morning on some sectors and evening on others.

With such a large estuary and a restricted number of available counters there were inevitably a small number of missing counts in each month and these are shown in tables. Provision was made for counts to be undertaken on two days either side of the allocated count date where it was impossible to arrange full coverage due to a lack of manpower. Differences in total numbers calculated for counts which were not strictly co-ordinated were considered to be inconsequential in relation to the differences generated by an array of other variables including observer ability, visibility, tidal conditions and weather. The principal aim of the low tide project was to establish the value of each inter tidal area to feeding waders and wildfowl.

All of the waders and wildfowl present within a sector or sub-sector were counted within two hours of low tide, the same time limits as are applicable to the WeBS core counts which are made within two hours of high tide. Due to the large areas which were covered by a small number of observers it was not considered practical to distinguish between feeding and roosting/loafing birds and thus all totals reflect the absolute number of individuals of each species present within the inter tidal area at the time of the count. Summed monthly counts from the single WeBS sectors are shown in the monthly tables in addition to which the twelve monthly count totals for each species for each sector and sub-sector are also presented.

Due to lack of available counters the provision was also made for teams of observers to cover missed sectors on dates before or after the proposed count date. It was considered that the problems of duplication raised by counting on different dates would be balanced by a similar scale of undercounting caused by the same factors of bird movements. As the principal aim of the project was to identify the intertidal areas which are used by waders and wildfowl and not to provide comparative absolute totals of waterfowl, counting on different dates was not considered to reduce the value of the results.

3. Introduction to the species accounts

The amount of data, produced by the twelve monthly low water and WeBS core counts of the Humber estuary during September 1998 to August 1999, was extensive. This data will prove invaluable in assisting EN and other bodies in future decision making on the estuary. Detailed analysis of the data was not undertaken due to the time restraints of the project.

All of the basic data, full count totals for each sector and sub-sector along with additional analyses demonstrating the key species occurring within each sector as a percentage of the monthly count total and peak feeding densities for key species is presented in Part Two of this report.

For the purposes of the present report a general overview of the occurrence of all species recorded during the census period is presented. Consequently there are no species accounts for the Great Northern Diver, Bean Goose, Pale-bellied Brent Goose, Red-crested pochard, Velvet Scoter or Woodcock. Moorhen and coot are not counted on a regular basis therefore no species accounts are given for them. Species are listed in systematic order following the latest British Ornithologist Union official list of the birds of Great Britain, 'The British List 2000'.

For key species details include WeBS core estuary status, where relevant, details of previous years WeBS core count data, often in diagrammatic form, and any additional information considered relevant to the present survey. Occurrence patterns and estuarine distribution are analysed. Any information on breeding species recorded during the 1999 season is included. It should however, be noted that no systematic census of breeding waders and wildfowl was conducted. With the exception of a few species, which are tied to a small number of breeding localities, such as Avocet, for which finite numbers were recorded, it is likely that the totals given for breeding birds represent an underestimate of the total estuary population. The totals presented are however, a best estimate from what was a fairly thorough but not totally comprehensive survey of breeding waterbirds. At the beginning of each species account figures are given for National and International importance. This is based on the figures presented in Cranswick *et al.* (1999). National importance (Great Britain) is based on the site regularly supporting 1% of more of the British population and International importance is based on the site regularly supporting 1 % or more of the international population of one species or subspecies of waterfowl. 1% thresholds have not been derived for introduced species.

4. Species accounts

Red-throated Diver *Gavia stellata*

Great Britain 50 International 750

Five birds were recorded on the January low water count off North Cotes (sector MSE).

Little Grebe *Tachybaptus ruficollis*

Great Britain 30 International ?

The majority of the little grebes found on both the WeBS core and low water counts were frequenting saline lagoons, tidal creeks or water areas immediately inland of the sea defences such as the Barrow-Barton clay pits. A maximum of 30 birds was logged on the March WeBS core count. A census of the Barton to East Halton clay pits in the same month revealed the presence of at least 60 birds, the highest total for over ten years.

Great Crested Grebe *Podiceps cristatus*

Great Britain 100 International ?

The count series peak of 14 birds, February WeBS core, was particularly poor. On the Barton-Goxhill clay pits a total of 16 pairs were noted in spring.

Slavonian Grebe *Podiceps auritus*

Great Britain 4 International 50

Two birds were present on beacon ponds, Spurn, from December through to March.

Black-necked Grebe *Podiceps nigricollis*

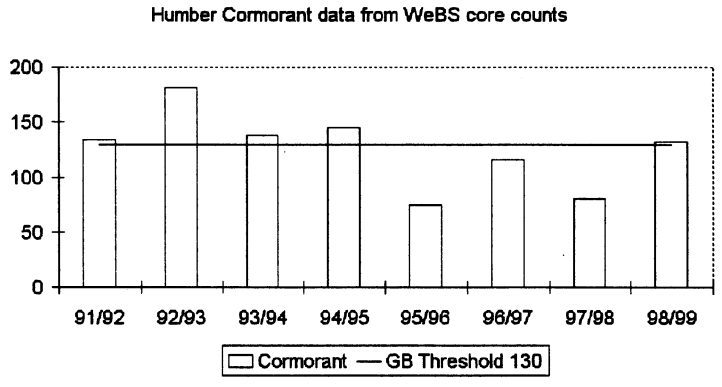
Great Britain 1 International 1000

One was recorded from beacon ponds on the April count date.

Cormorant *Phalacrocorax carbo*

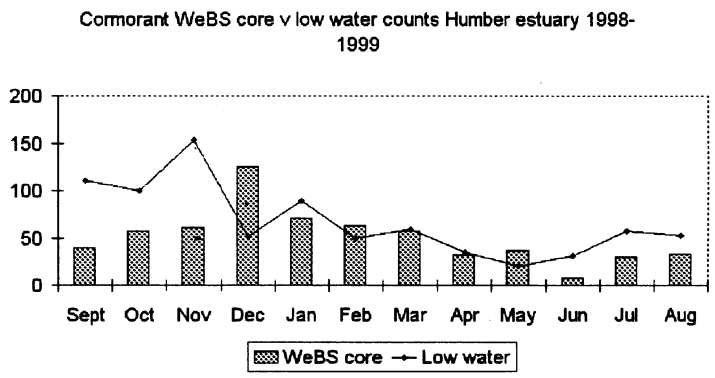
Great Britain 130 International 1200

In the most recently published WeBS report covering the period 1997-1998 (Cranswick et al 1999), the Humber was one of the sites which no longer meets the qualifying threshold of 130



necessary to maintain it as a site of National Importance as defined in the WeBS core count criteria.

During the September 1998 to August 1999 period the Humber WeBS core counts varied between a low of 8 birds in June 1999 to a high of 125 in December 1998. Low tide data by contrast recorded a low of 20 in May 1999 and a high of 153 in November 1998, the latter 18% higher than the peak WeBS core count.



Larger numbers of Cormorants are known to occur on the estuary than are usually recorded by WeBS counts due to the fact that birds which roost and loaf on the estuary spend long periods feeding at inland localities during the daylight hours. Birds disperse down the Rivers Ancholme and Trent, along the Ouse and also inland from the coastal sites to feeding sites such as Covenham Reservoir which attracts up to 120 birds in mid winter. Low tide counts revealed the presence of greater numbers of feeding birds but co-ordinated roost counts remain the best method of assessing the true population size. At present two main roosts are known, on the old forts off Humberston Fitties, in the estuary mouth, and on various lightships situated between Winteringham Haven and Barrow Haven. It is possible that other lightships are also used for roosting and that there may be other roost sites elsewhere on the estuary.

During the survey period mean counts for the three four monthly periods November-February, March-June and July-October were; 86 (Low tide - L) 80 (High tide - H), 36L 33H and 80L 40H respectively.

There are as yet no known breeding sites on the estuary or its immediate surroundings but birds have been seen in display at two localities and future breeding is a possibility given the expansion of the inland breeding colonies in recent years. Estuary populations are thus at their lowest during the breeding season, March-June, as only immature non-breeders remain at this time. The species disperses quickly following breeding however, and numbers rise quickly from July onwards.

Sightings of colour ringed birds have revealed that birds wintering on the estuary have originated from breeding colonies in Nottinghamshire (Besthorpe), Essex (Abberton Reservoir), Scotland (Solway Firth and Dumfries & Galloway) and Northern Ireland. Typical distribution on the estuary is shown by the summed low tide data for September-December 1998; there are four main loafing/feeding areas at the Ouse/Trent confluence, Read's Island, Barton-Barrow Clay pits and adjacent estuary and the southern foreshore between Humberston and Tetney.

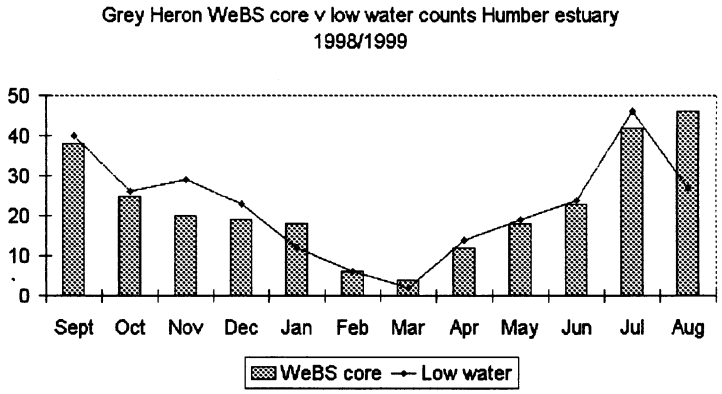
Little Egret *Egretta garzetta*

Great Britain ? International 800

One was present at Blacktoft on the August WeBS core count.

Grey Heron *Ardea cinerea*

Great Britain ? International 4500



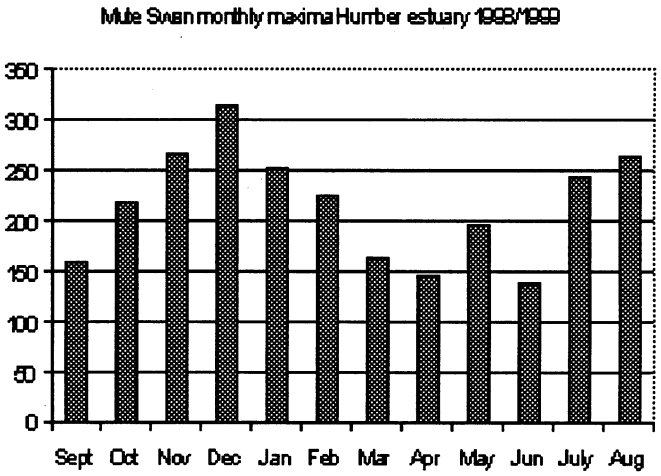
The highest counts of this species on the estuary were recorded during the post breeding dispersal of adults and juvenile birds in July and August 1999. A peak of 46 birds was noted on both low water and WeBS core counts but in different successive months, July and August respectively. The months with least birds present, January to May inclusive, coincided with the species early breeding season.

Mean monthly counts for the five-month breeding and seven month non-breeding seasons were 12 and 30 for the WeBS core counts and 11 and 30 for the low water counts; very similar figures.

Birds were generally widely distributed with the exception of local concentrations on the lagoon systems at Blacktoft Sands RSPB and Read's Island.

Mute Swan *Cynus olor*

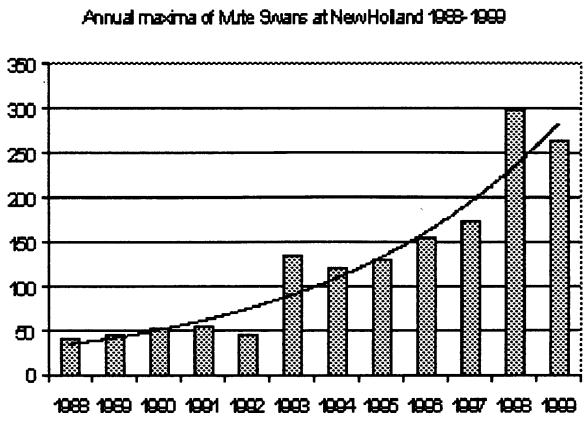
Great Britain 260 International 2400



In excess of 90% of the estuary total of this species in every month of the review period came from one locality the two sectors, ISF3 and ISG, immediately east and west of New Holland Pier. The concentration of birds at this locality is a direct result of the inadvertent provision of foodstuffs, in the form of spilt grain and animal feeds, from the New Holland Bulk Services complex, which operates on the site of the old ferry terminal.

Differences between low water and WeBS core counts were largely a result of parts of the main New Holland flock being hidden from view on certain low tide counts due to their use of inaccessible localities. Thus it is most practical to take the peak monthly count from both sets of data to provide the most accurate estuary total. Using this method the monthly totals varied

from a peak of 314 in December to a low of 132 in June when immature non-breeders form the bulk of the flock.



Peak annual counts of Mute Swans at New Holland have increased exponentially since the mid-1980's see diagram.

If this increase continues or even if recent peaks are sustained then the species may attain the necessary level for the estuary to be recognised as being of national importance for mute swans in the next four to five years.

The increase in the number of birds at New Holland has coincided with a national resurgence of the species following the banning of lead shot in fishing weights but has obviously been further enhanced locally by the continuing supply of foodstuffs. The increase in wintering birds has led to a consequent rise in the size of the breeding population of the Barton to East Halton Clay pits where 26 pairs held territory and 20 bred in 1999 compared to just five in 1992. Observations of colour ringed birds at New Holland has shown that some originate from as far afield as Southern Scotland, Borders region, Northumberland and Teeside. A large proportion has been ringed on the Derwent and Pocklington canals in North Yorkshire where another scheme is in operation. A full analysis of recoveries has not been carried out to date but it is clear that some birds spend long periods (up to two years) on the estuary, mainly as immatures, while some make very brief transient visits. Return movements to moult sites at Fairburn Ings and inland sites in Yorkshire have been apparent and some adults have been proved to return to New Holland to winter after returning to their natal areas to breed. Others have moved to New Holland to moult and returned to their breeding areas in summer. One male ringed in 1993 arrived on the Humber in 1995 and has since held a territory and bred during 1997-1999.

Bewick's Swan *Cygnus columbianus*

Three adults joined the New Holland swan flock briefly on the November count date and two were at Blacktoft in January.

Whooper Swan *Cygnus cygnus*

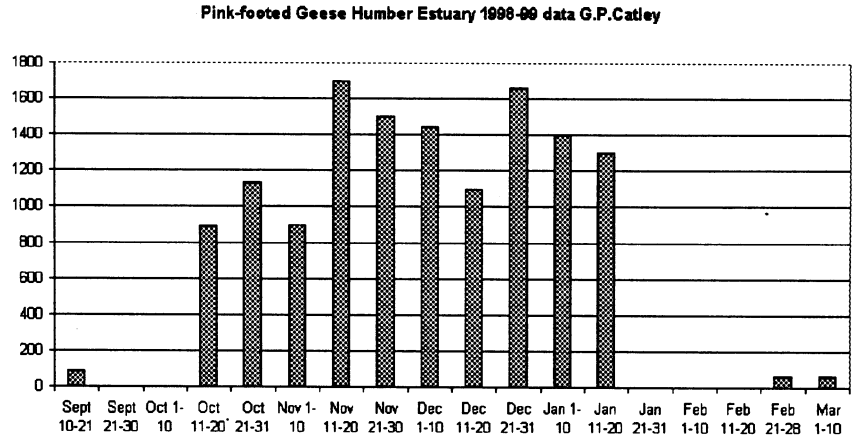
A small flock, maximum 16 birds, wintered with the Mute Swans at New Holland in addition to which two very tame adults of suspect origin joined the same flock between June and August 1999. One of the wintering flock was a returning colour ringed adult male previously marked in Iceland, which wintered at New Holland in 1997-98 but had also occurred in Borders region and Ireland. The number of birds wintering at New Holland has shown a steady rise from one in the 1993-94 winter to the recent peak of 16, all of which are assumed to be of Icelandic origin.

Pink-footed Goose *Anser brachrhynchus*

Great Britain 1900 International 2250
As this species spends much of the daylight hours feeding on inland fields and essentially uses the estuary as a roost and loafing site it is rarely recorded on either WeBS core counts or low tide counts in representative numbers.

During the 1998-99 winter the favoured roost site for this species was the mudflats and sand bars to the north of Read's Island and latterly the new saline lagoons on the remnants of the island itself. From here birds travel into adjacent areas of north Lincolnshire in an arc between south-east and south-west to favoured feeding localities.

The peak counts recorded by WeBS core counts were just 601 in January and 528 in October 1998. More accurate counts of feeding and roosting birds made in conjunction with local surveys and the National Grey Goose census in October and November revealed peaks as shown in the following diagram.



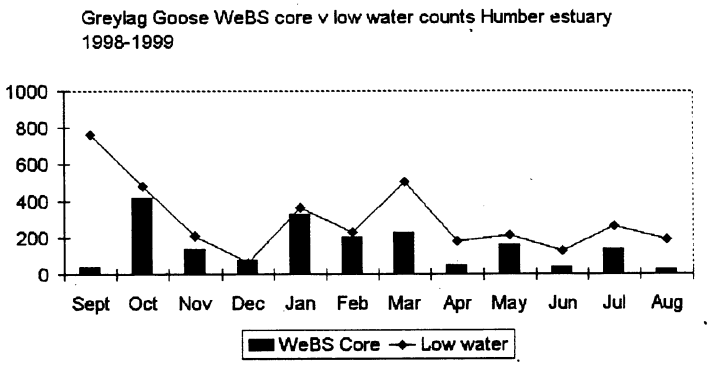
White-fronted Goose *Anser albifrons*

Great Britain 60 International 6000

A family party, two adults and three juveniles, accompanied the Pink-feet flock during October 1998 and were noted on that month's counts. One was at Blacktoft in December and probably the same at Read's island in January and March. It was usually in the company of Greylags and was most probably an escapee. What is presumed to have been the same bird remained in the Read's island, Brough to Barton pits area throughout 1999.

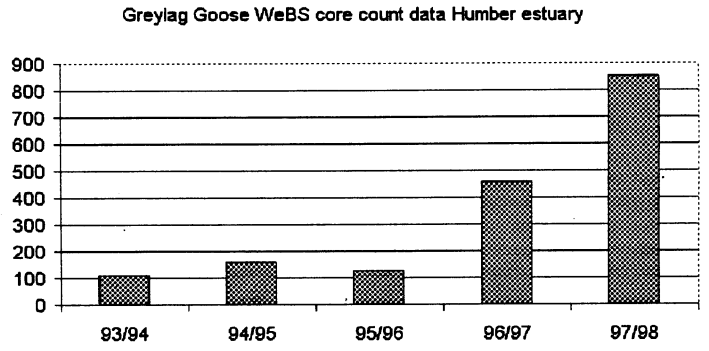
Greylag Goose *Anser anser*

Great Britain 1000 International 1000



There appears to be little published information upon the movements of the naturalised population of this species, which exists, on the upper Humber. From a fairly tenuous start the population has recently increased at a phenomenal rate such that the 1999 autumn peak counts have topped 1000 birds for the first time. If left unchecked this population looks set to become a major part of the estuarine wildfowl population.

Greylag Geese are only encountered on the estuary sporadically after the autumn population peak and there is the distinct possibility that there is a regular interchange between the Humber and the Lower Derwent.



WeBS core counts and low water counts revealed striking diurnal differences between count figures which suggests that birds feed well away from the estuary, probably on autumn stubbles, in September and October.

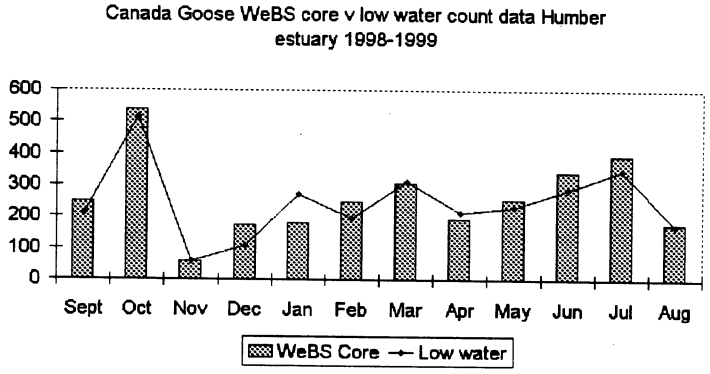
The vast majority of the population is still concentrated in the area bounded by the Humber Wildfowl Refuge east to Brough. There have of late however, been signs that birds are moving out from this centre. A flock of up to 43 birds wintered in the area of Read's Island in 1998/99 and up to 38 occurred on the Barrow Haven to Barton Clay pits during the same period. This spread of wintering birds also led to increased breeding outside the core area in 1999 with three broods seen on Read's island and ten pairs rearing 49 young at Barton. Judging from the number of goslings and family parties present around Whitton Sand in late summer, a substantial number of pairs must breed, presumably on Whitton Sand and adjacent areas of the estuary.

The estuary population peaked in September and October with the 762 birds counted in September 1998 actually being down on the 854 recorded by the September 1997 WeBS core count. The fall seems likely to have been illusory however, as counts in September 1999 revealed further increases to over 1000 birds.

Past WeBS core count data show a truly dramatic rise in the estuary population from just 109 in 1993/94 to 459 in 1996/97 and 854 1997/98 producing a five-year mean of 342.
With the exception of one month, December 1998, more Greylags were found on low water counts than on WeBS core counts. Feeding away from the immediate environs of the estuary obviously accounts for most of the differences between the two sets of count figures.

Canada Goose *Branta canadensis*

The maximum number of this species recorded by any of the 1998/99 counts was 538 on the WeBS October core count. This total amounts to just 70% of the maximum count of Greylag Geese during the same period and demonstrates the much faster rate of growth of the latter's population.



The total number of birds recorded on any count was influenced by the extent of daytime feeding on fields away from the estuary and thus there is little significance in the differences between the two sets of count data.

In all months almost the entire estuary population is located within the upper estuary at three broad localities; the Humber Wildfowl Refuge, Read's Island to Winteringham and the Barrow/Barton Clay pits complex. At the latter two areas breeding success in 1999 was fairly moderate with less than 100 juveniles seen around Read's island and ten pairs rearing 31 young from seven broods at Barton. There appears to be considerable interchange between the three broad area groups most obviously during the autumn when stubble feeding leads to concentrations of birds in favoured areas. A maximum of 500 birds occurred together at Barton in September 1999 and birds were frequently noted mixing with feeding flocks of Pink-footed and Greylag Geese on autumn stubbles at South Ferriby and Winteringham in 1999.

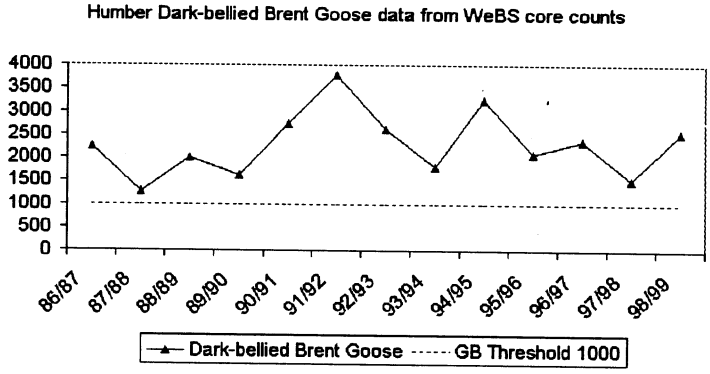
Barnacle Goose *Branta leucopsis*

Great Britain 270 International 320

A free flying flock of up to 30 birds are present on a smallholding in Whitton village on the south bank. The movements of these birds around the upper estuary serve to mask the occurrence of small numbers of wild birds that may appear in the area. Proven wild, colour ringed birds, have however, been noted in the same area and one bird ringed on the Solway actually joined the Whitton flock for a period in 1998. During the survey period single birds were noted at Cherry Cobb in January and Whitton Sand and Brough in April and May with 12 birds at the latter site in July.

Dark-bellied Brent Goose *Branta bernicla bernicla*

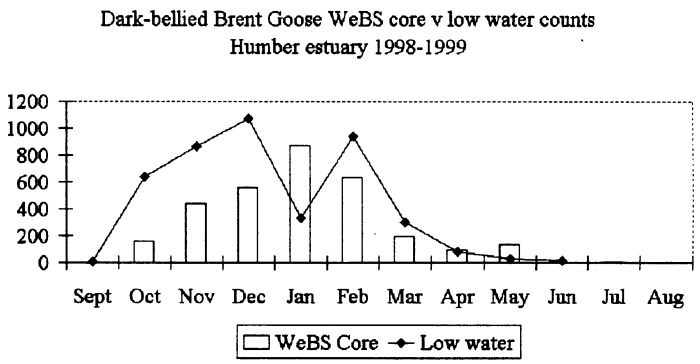
Great Britain 1000 International 3000



Dark-bellied Brent Geese occur almost exclusively on the outer estuary principally along the southern shore from Cleethorpes to

Saltfleetby with lesser numbers on the north shore between Sunk Island and Spurn. As the outer south shore, Pyes Hall to Mablethorpe, was not included in the low water counts the relatively low peak count of 1074 in December 1998 was well down on the WeBS core count average for 1993/94 to 1997/98 at 2203. Looking at the 1998/1999 core count data and adding the totals for the outer south shore however, gave a winter peak of 2540 birds in December 1998. This actually formed the highest WeBS core count for the estuary since the 1994/95 winter in spite of another almost complete breeding failure in the 1998 season evidenced by a lack of juveniles in the wintering flocks.

The first substantial arrival of birds in autumn 1998 occurred after the September count date with numbers increasing thereafter to their peak in December 1998. The population then remained fairly static with high counts returned through to February 1999 following which numbers fell rapidly by March but of note was the count of 133 birds still present in May.



A maximum of 462 birds were recorded at low water (November) between Grimsby Docks and North Cotes with 1016 (December) between North Cotes and Grainthorpe Haven. On the north shore totals were much smaller with maxima of just 31 Sunk Island area, NH, February, 30 Welwick area, NJ, October and 206 Spurn, NK in February.

The maximum-recorded density of birds at low water was just 2.01 birds per hectare on the mid-south F sector, Horseshoe Point to Pyes Hall in December 1998. The species obviously feeds at much greater densities than this over parts of the available intertidal area and as such densities calculated for such large sectors produce somewhat misleading results. On the south shore in recent winters large numbers of birds have on occasions also been recorded feeding on fields of pasture, cereals and oilseed rape inland of the sea defences with birds sometimes flying up to a mile inland.

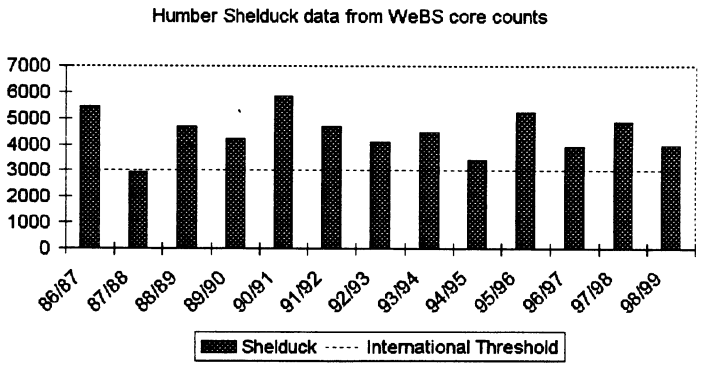
Ruddy Shelduck *Tadorna furruginea*

One was present in the Winteringham to Brough area during the late summer, August onwards, and was recorded from Winteringham on the August count. A further party of four birds which arrived in the Read's island area in late August were seen at New Holland on September 7th before returning to South Ferriby. They stayed in that area to 23rd when the fifth bird joined them, all five being seen daily to October 3rd.

Shelduck *Tadorna tadorna*

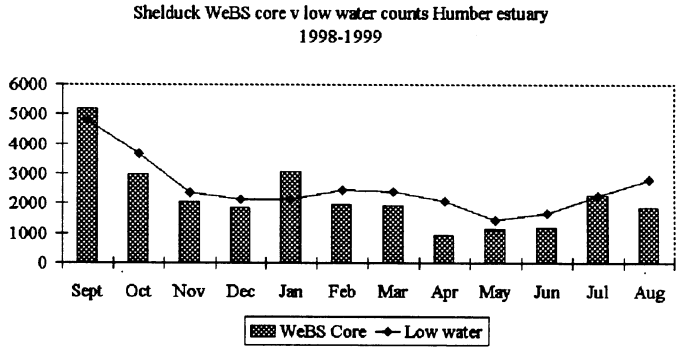
Great Britain 750 International 3000

Shelduck is a key species on the Humber with Internationally important wintering and passage populations and a notable breeding population. The estuary is also developing as an important moulting site for the species.



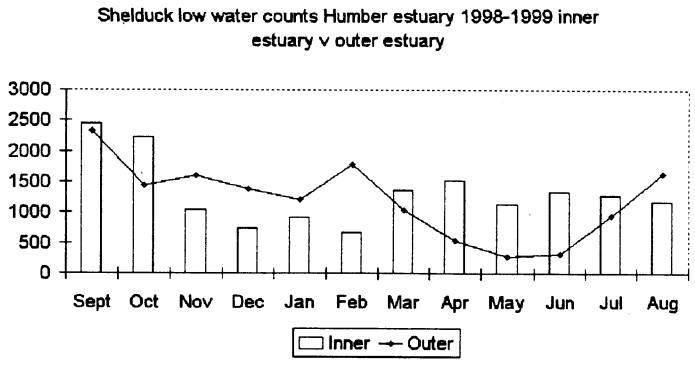
WeBS core count data for the most recent last five seasons presented in the 1996/97 WeBS report showed a maximum Humber count of 5240 recorded in the 1995/96 winter. This total is the only recent one to exceed the peak of 5186 birds recorded during the present project in September 1998. That particular month's data did not include birds on the outer south shore but still stands as the highest count of the season even when additional birds from the outer south are added to the October-May Core counts thus producing a winter peak count of 3999 birds in January 1999.

Shelduck has the most widespread distribution of any species of duck on the Humber. As it exploits the rich feeding provided by the huge areas of intertidal mudflats the species is closely tied to the immediate estuarine environment with most birds being located close to their chosen low tide feeding areas even at high water. At first sight therefore, differences between the two sets of count data would appear to be hard to reconcile but looking further at the data the species provides some particularly interesting patterns of occurrence within the estuary.



The overall pattern of occurrence as shown by the monthly low tide count totals revealed an obvious autumn peak in September, 4763 birds and October, 3683 with a clear decline by November to a fairly stable winter population level of 2121 to 2454 birds present between November and February. Interestingly using the same type of analysis as performed for the WeBS low water count data in the WeBS report, ie; taking the four monthly means of summed sector counts and summing these, produced an estimated wintering population of 2473 birds compared to an observed peak of 2454 during the same period. This difference being the result of the means taking into account missing data from certain key sectors in some of the months concerned.

In excess of 2000 birds were counted in March and April followed by a sudden fall to 1416 and 1653 respectively in May and June. The movement of breeding birds away from the immediate estuary environs could account for at least some of this loss of birds. A resurgence in numbers in July and August was correlated with the appearance of crèches of juveniles, which in turn compensated for the loss of adults and sub-adults, which departed to traditional moulting ground in the Wadden Zee. During migration periods estuary counts may well be affected by the transient appearance of flocks of Shelduck moving between the Wadden Zee and the English west coast estuaries as many are known to follow an east-west cross country route involving the Humber.

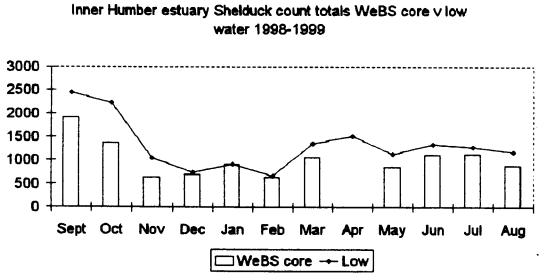


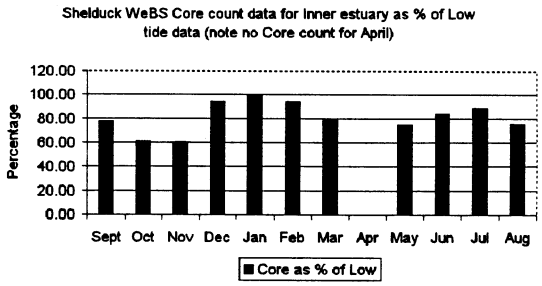
In spite of the widespread distribution there is a clear split between two major concentrations of the species on the Humber. On the upper estuary, to the west of the Humber bridge, birds occur throughout the sectors with a very clear increase westwards from Barton Chowder Ness on the south shore and North Ferriby on the north shore. The second area of occurrence on the outer estuary can be located east and south of a line drawn from Saltend to North Killingholme Haven. The sectors between these two major areas, inner south E2 to I and north E record very few Shelduck. Regular observations of visible migration conducted from the south shore, by the Humber bridge at Barton, have revealed that there is minimal interchange between these two population centres between tides and even over extensive periods of the year. The exception being during periods of migration when flocks of shelduck move east in early autumn and west in late autumn and early winter. Thus it is perfectly feasible to analyse the data from the outer and inner estuary separately for the course of this project.

Within the general pattern of occurrence noted above there were clear differences in the patterns involved with respect to the two major centres of distribution on the estuary. Two principal points arise from separate analysis of the data for the above two populations. The general pattern of occurrence throughout the project period, as detailed above, becomes more complicated. On the outer estuary the peak population level fell quickly between September and October, 2323 to 1449 and then remained relatively stable to March varying between 1038 and 1782 differences partly accounted for by missing sector counts in certain months (see table 14). The April figure declined suddenly to just 546 and fell even further to a zenith of 276 in May before increasing again in July and August to an autumn peak. By contrast on the inner estuary the autumnal peak lasted through September to October, 2440 and 2234 then fell to between 1054 November and 672 February for the winter period. A notable increase then followed in March and April to 1358 and 1512 with high totals maintained throughout May to August. This difference in pattern can in part be attributed to the larger breeding population on the upper estuary but there are also a very large percentage of non-breeding birds, which summer in this area. Whether they are immature birds or non-breeding adults is not known.

The upper estuary also now supports an important number of moulting birds through July and August which are concentrated in the Whitton Sand to Brough and Winteringham to South Ferriby and Read's Island areas.

The second major finding in respect of analysis of the two sets of count data, for WeBS core and low water figures, can only be applied to the upper estuary population due to the number of missing counts from the outer estuary and the additional possibility that there may have been movements between counted low water sectors and the outer south shore which was only counted for WeBS core counts.





Analysis of the inner estuary data reveals an interesting and consistent pattern. With the exception of January, when the two counts were undertaken on separate weekends, and the resulting low water and core count figures were identical but for one birds 913 low 914 high, all of the series of counts recorded higher numbers of shelduck at low water. WeBS core counts formed between 60.7% and 94% of the low water counts totals. With no recorded movement of birds across the Humber bridge divide between tides it is clear that the low water counts provided a more accurate assessment of the upper estuary population.

This is a significant factor in determining the total estuary population levels. With respect to the series of data being analysed the addition of missing birds, recorded at low water and not on the peak core count in September 1998, would raise the estuary peak count to 5719 birds, a 10% increase.

Possibly for the first time with the co-ordination of summer counts it was possible to arrive at a representative figure for the number of young shelduck reared on the estuary in summer 1999. Although some juveniles were large enough to make distant ageing somewhat difficult by the time of the mid July count a total of 365 juveniles were identified and this was considered to form a representative figure for the whole estuary. Young of the year thus formed 16% of the total of 2235 birds present on the July count. Of these 299 (82%) were found west of the Humber bridge, where the greatest number of breeding birds are concentrated. By contrast only 1279, 57%, of the total count of the species, adults and young, were in the same part of the upper estuary but 846 (38%) were on the outer north bank between Stone Creek and Spurn.

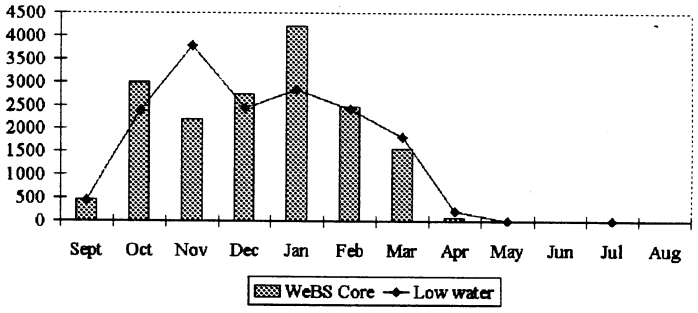
Eurasian Wigeon *Anas penelope*

Great Britain 2800 International 12500

The Humber population of Wigeon is located principally on the upper estuary between Trent Falls and Crabley Creek on the north shore and around Read's island and the adjacent South Ferriby to Winteringham Haven foreshore on the south bank. In some years there are also

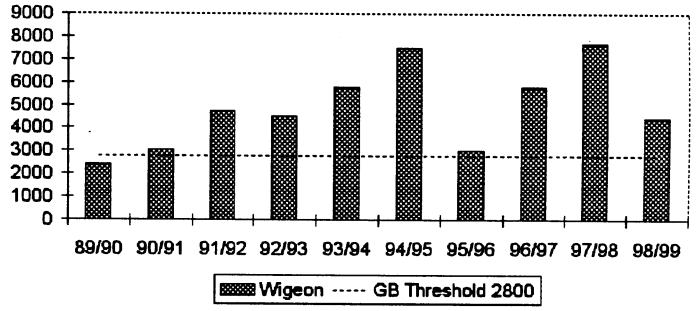
significant numbers on the outer south shore especially at Saltfleet and Saltfleetby. Occurrences outside of these areas tend to be rather spasmodic. They may be related to the existence of an undisturbed food supply and roost site or possibly to birds spreading round the estuary at times of high population levels. Other occurrences possibly reflect the spasmodic appearances of migrant flocks particularly during August to October when birds are arriving on the east coast. Of note during the count series were fairly regular small numbers at North Killingholme Haven pits, sector ISJJ, between October and March, peaking at 68 in February and along the north shore around Sunk Island, sector NH, with six to 344 recorded between October and February, the peak being in the latter month. On WeBS core counts the Cherry Cobb sector, NG, also produced 320 birds in October 1998.

Wigeon WeBS core v low water counts Humber estuary 1998-1999



The two tidal count series produced peaks in different months, 4210 on the WeBS core count in January 1999 with 3790 two months earlier on the low water count in November 1998. As the species feeds mainly on greenshore areas and adjacent fields of pasture and, of late, oilseed rape, often at night, and is not strictly tied to intertidal areas there would appear to be little reason for the observed differences between core and low water count data. Indeed the results show that the two sets of data were very similar in most months with the very real exceptions being November 1998, 3790 low water and just 2209 WeBS core and January 1999, low water 2842 and WeBS core 4210. The latter two counts were however, undertaken on different weekends, which could account for the discrepancy whereas the difference between the two November figures are hard to explain.

Humber Wigeon data from WeBS core counts



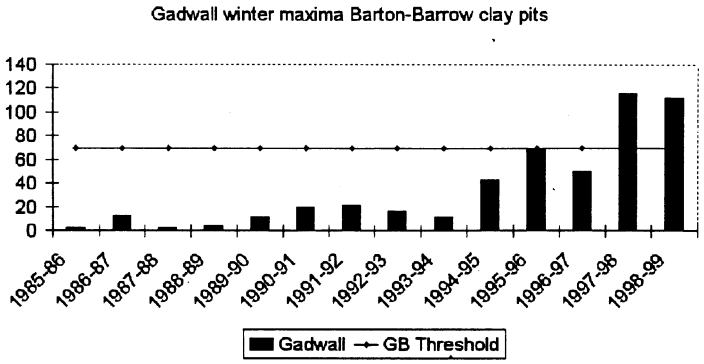
Taking into account the additional WeBS core data from the outer south shore for the November to March winter period reveals that the whole estuary peak winter count of 4439, recorded in January 1999, was the lowest winter peak for six seasons, only the 3000 in 1995/96 being lower. The total formed only 58% of the 1997/98 peak count and amounted to just 75% of the five-year estuary mean.

Gadwall *Anas strepera*

Great Britain 80 International 300

This dabbling duck tends to occur on the intertidal areas of the estuary only on the saline lagoon systems at Blacktoft and Read's Island. In addition to these areas an increasingly important population occurs on the adjacent clay pits at Barrow Haven and Barton. As these

birds occasionally disperse onto the estuary during periods of disturbance they were counted for the WeBS core and on some of the low water counts.

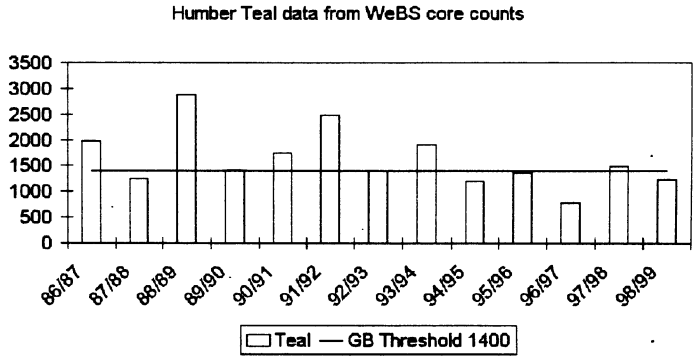


Peak estuary totals in the review period were 76, January 1999 WeBS core, and 58 on the low water count in August 1999. Neither count is a true reflection of the winter population as 112 were counted at Barton pits alone in December 1998. Indeed the peak winter counts at this site have increased rapidly during the 1990's and should qualify the site as being of national importance. Numbers at Blacktoft peaked at 28 in January 1999 and a party of 15 birds was noted at Read's island in August 1999.

Teal *Anas crecca*

Great Britain 1400 International 4000

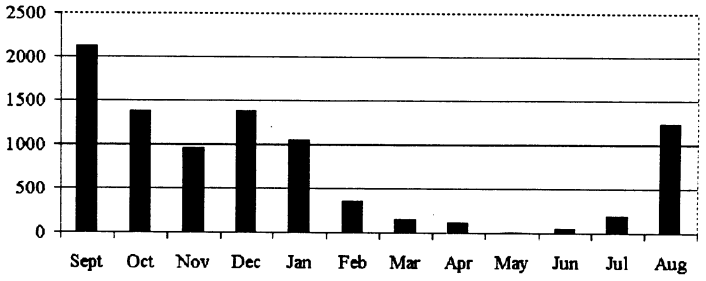
The number of Teal recorded on the Humber have shown a medium term decline such that the estuary no longer qualifies as being of national importance using WeBS criteria.



Traditional autumn peaks were apparent during the survey period with the maximum total of the series being that of 2118 recorded on the low water count for September 1998. Apparent differences between WeBS core and low water counts in the data series are difficult to interpret due to the complicated situation presented in the Read's island and South Ferriby area, sectors ISD and ISE1. Since the creation of a series of saline lagoons on the island in the autumn of 1997, by a partnership of the RSPB, Lincolnshire Trust and Environment Agency, exceptional numbers of dabbling duck have been attracted to the site in autumn and winter. If the birds are on the island, as there is no regular access, they are only visible from a vantage point on the Wolds about one to two kilometres away. Determining the specific identity and numbers of the duck present is not possible with any degree of accuracy even in the best of viewing conditions. The appearance of these birds on adjacent mudflats is affected by a number of factors, which include the prevailing weather including, wind force and direction, precipitation, and overall temperature, and degree of disturbance from, in the main, raptors. Low water counts thus provide the best opportunity for obtaining a representative count of the species when they are off the island but regular commuting of flocks between intertidal feeding sites and the adjacent lagoons adds further complications. In mid-winter in particular more birds remain on the island for longer periods and obtaining a representative count on a set date is rather arbitrary.

Analysis of the review period data reveal a fairly typical seasonal pattern for the Humber with an autumn peak in September and October following which numbers declined through to January with a rapid tail off from then on to a series low in May. A return of non and failed breeders in June commenced the autumn build up which continued through July to an early autumn peak in August. The winter, November to February, low water peak count formed just 65% of the autumn maximum while the winter WeBS core count formed 75% of the reduced autumn WeBS core maximum. The species is very much an inner estuary bird with key concentrations in the Read's island to Winteringham Haven area, at Blacktoft and Whitton Sand to Brough. Another key area to the east of the Humber bridge spans the estuary between Saltend and Goxhill Skitter Ness, sectors NF and ISH. In contrast to the upper estuary sites, where numbers of teal peaked in September and October and fell rapidly thereafter, numbers at Saltend peaked in November to February with an exceptional 800 birds recorded in December 1998. These winter peaks on the mid-outer estuary tended to compensate for the falling numbers on the inner estuary during the same period.

Teal peak monthly totals from WeBS core and low water counts Humber estuary 1998-99



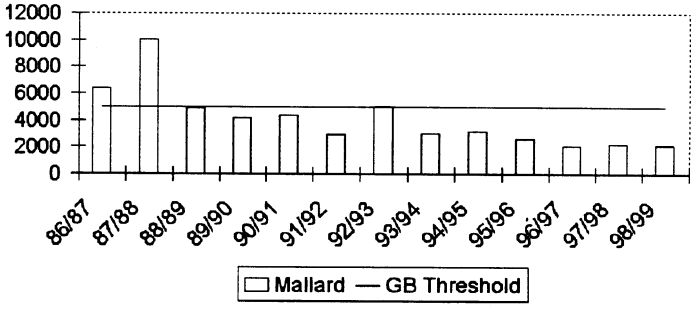
With respect to the high autumn totals in the Read's Island area it is worthy of note that following the August 1999 count, when 1080 birds were recorded there, a record 2250 individuals were present ten days later and up to 2000 birds have been recorded throughout September 1999

Mallard *Anas platyrhynchos*

Great Britain 5000 International 20000

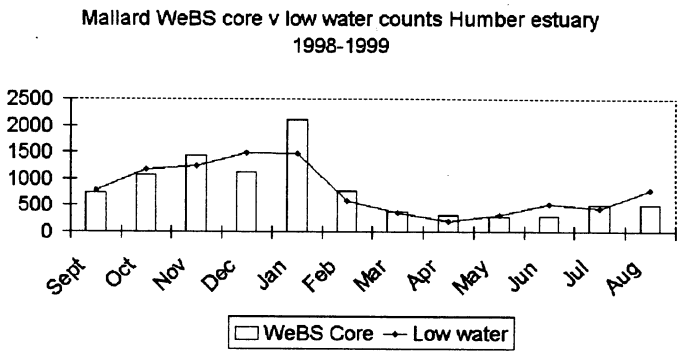
The severe decline of the `common wild duck' has recently received widespread national coverage with the latest WeBS report detailing a 40% decline in recorded totals over the last ten years. The situation on the Humber mirrors the national scene (A Grieve, August1998, Humber WeBS counters newsletter). In summary the Humber has lost its status as the only nationally important site for Mallard within Great Britain as a huge decline in wintering numbers has taken place in the past 30 years. The Humber now ranks as only the eighth most important site in Great Britain for wintering Mallard. The pattern of distribution has also changed markedly with a shift from the inner estuary to the outer north shore. At least in part the redistribution of flocks is thought to reflect increasing releases of captive bred birds by wildfowling syndicates and clubs. WeBS core counts clearly demonstrate the rapid decline in the species fortunes on the Humber. There are suggestions from the last three seasons that the

Humber Mallard data from WeBS core counts



population may have now stabilised but as shown in the analysis of the 1998/1999 count data the single peak count for the 1998/1999 winter appears to be somewhat anomalous and a further real decline may have taken place. Even with a winter population of around 2000 birds this level needs to be set in the context of annual autumn releases of 500-1000 birds from a number of single sources around the estuary. Clearly the wisdom of such releases and the potential effects of this stock on the remnant local population is worthy of further investigation.

It also seems to be obvious that the estuary no longer receives the large arrivals of wintering birds from Scandinavia and the east which formed a large part of past winter totals. It has been suggested that the decline of the species noted in Britain may be more widespread and could be affecting the populations, which form the source of our winter visitors. Alternatively there are theories that due to the increasing mild winters which northern Europe is experiencing more birds are remaining on the near continent and only moving to Britain in the harshest of weather conditions. The compounded effects of global climate change seem set to manifest themselves in the population levels and movements of many species of bird within the foreseeable future; the Mallard may be a species in point.



Mallard data from the 1998/1999 WeBS core and low water counts present no consistent pattern with peak monthly counts split evenly, six core counts exceeding low water counts and vice versa. The data for this species is particularly affected by the variability of coverage on the outer north shore however, and thus no meaningful comparison of the two sets of data is practicable.

Perhaps significantly the highest overall count of the series, the WeBS core count for January 1999, at 2100 exceeded the next highest core count of 1444 in December by 656 birds 31%, and the highest low water count of 1465, December 1998 by 615 birds, 29%. The exceptional total of 500 birds recorded on the Welwick to Easington sector, NJ, on the January core count, 300 birds higher than any previous count on that sector obviously had a marked effect on the estuary peak for that month. Taking the mean values of the four winter months, November to February, gives figures of 1358 for the WeBS core counts and 1194 for the low water counts. It would seem from the figures that the Humber population is in a worse state than indicated by simple winter peak WeBS core count data. Indeed the inclusion of additional data from the outer south shore only lifts the winter peak by a mere 49 birds and the maximum number recorded on the outer south sectors in the winter was just 66 birds.

Both sets of data reveal a marked fall in numbers between the January and February count dates no doubt a reflection of the very mild winter weather inducing breeding birds to commence nesting activities early. Throughout the spring and summer the number of birds recorded was a mere reflection of those breeding birds located on estuarine lagoon systems, such as Blacktoft, and suitable nesting sites close to the estuary like the Barrow Haven and Barton clay pits. At the latter site a total of 45 broods totalling 297 juveniles were seen of which 116 fledged. The poor post breeding totals recorded by the July and August counts,

maximum 789 August low water may simply have been a reflection of inland stubble feeding which is prevalent in the early autumn.

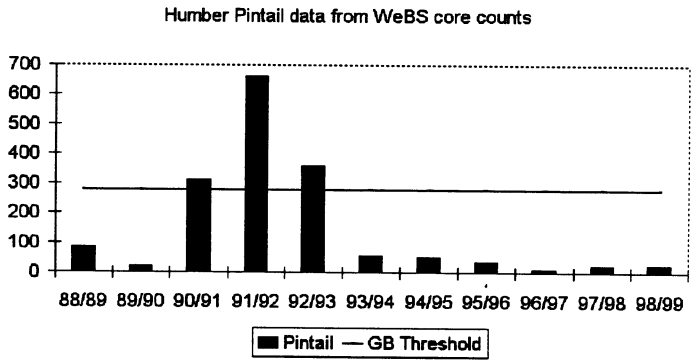
The species' distribution within the estuary has undergone a dramatic shift over the last 30 years. The upper estuary and in particular the Humber Wildfowl Refuge which formerly supported the majority of the Humber winter population now holds at the most 20-25% of the winter's peak. The HWR where up to 8000 birds were recorded as recently as 1980/1981 produced a maximum winter count of just 230 January WeBS core count and 156 January low water count respectively 11% and 10% of the estuary totals.

The only other site on the inner estuary to hold reasonable numbers of Mallard was the Read's Island area where 16% of the winter population occurred in January. Other sectors east to New Holland and Saltend held up to 50 bird but the latter two areas between them produced 50% of the estuary low water count total for the peak winter month of December 1998. The fact that the population at New Holland are apparently dependent upon an artificial food source (see Pochard) is a somewhat disturbing fact. Indeed it may well be that a lack of winter food caused by agricultural intensification in the form of autumn cereal sowing and the consequent loss of winter stubbles, as a food source, has had the greatest effect upon the Mallard population.

The south shore of the estuary from Goxhill Skitter Ness to Grainthorpe held very few Mallard throughout with a single sector winter peak of just 74 at Pyewipe. Between October and January although few birds were located on low water counts, maximum 169 November, the north shore sectors from Cherry Cobb to Easington, NG, NH and NJ recorded large numbers of Mallard on the WeBS core counts. Monthly summed totals for these three sectors of 441, 544, 90 (no count in G) and 1049 formed respectively 40%, 38%, 8% and 50% of the estuary totals for these four months. This area of the estuary obviously now supports a large Mallard population but this is apparently in part supplemented by releases of captive bred birds by local wildfowling syndicates.

Pintail *Anas acuta*

Great Britain 280 International 600



Peak numbers of Pintail are generally recorded on the Humber during the autumn migration period of September to November when birds en route to west coast estuaries may stop off for a few days or even weeks. Visible migration watches confirm that large numbers of birds move along the estuary during this period but their appearance on WeBS counts is in general a reflection of fortuitous timing. Variable numbers do however, remain on the upper estuary for periods of days or even weeks during this period perhaps in response to the presence of available food or a combination of this and the strength of the passage or even prevailing weather conditions. Formerly the estuary was briefly able to achieve the status of national importance for the species based on high WeBS

counts from three consecutive seasons 1990/1991 to 1992/1993 when peaks of 313, 660 and 360 respectively were logged. The upper estuary has traditionally been the favoured site for the species in particular the HWR where numbers in the autumn of 1991 peaked at an unprecedented 1375. These birds were attracted to feed on a field of un-harvested cereals and significantly many were shot. With the decline in the wildfowl populations using the refuge the overall estuary totals have also declined in recent years.

The high numbers of wildfowl using Read's Island in the last three autumns have included variable numbers of Pintail but as with Teal and Wigeon they are very difficult to count and actual numbers may well be higher than those recorded. In the autumn of 1999 a site visit to the island revealed the presence of 60 birds but a maximum of only 26 was recorded from the adjacent shore.

During the 1998/1999 counts a maximum of 46 birds were noted at low water, all on the western end of the HWR, sector NB1, while a peak of only 14 was recorded by any WeBS core count, in October 1998.

Garganey *Anas querquedula*

Great Britain too small for a meaningful figure to be obtained International 20000

Three birds were present on North Killingholme pits, sector ISJJ, on the August count date.

Shoveler *Anas clypeata*

Great Britain 100 International 400

Shoveler is a somewhat atypical duck within the general composition of estuarine wildfowl populations. Humber totals during the 1998/1999 survey were very similar at high and low water as the species was only recorded regularly from four sectors, all of them made up of either saline lagoons or clay pits. The four localities, Blacktoft, Read's island, Barrow/Barton clay pits and North Killingholme Haven wader pits recorded respectively maxima of 89 October, 182 August, 15 June and 19 February.

Overall the counts show the expected autumnal peak through August to October with a further notable count of 57 in March on the WeBS core count.

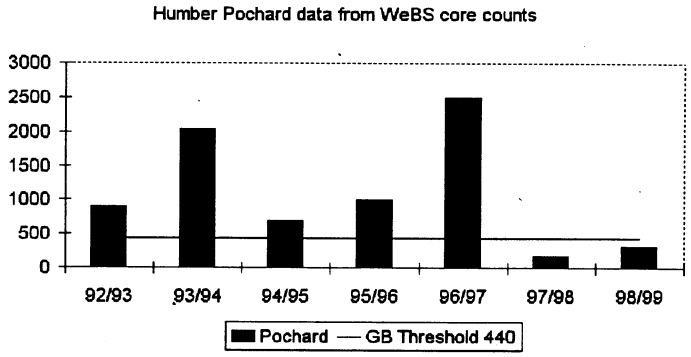
The exceptional concentration of 182 birds on Read's island mudflats in August contributed the bulk of the maximum series count of 203 individuals in that month.

Pochard *Aythya ferina*

Great Britain 440 International 3500

During the period from the late 1980's to date, an increasing percentage of the estuary wildfowl population has been made up of three species of diving duck, pochard, tufted duck and goldeneye. The bulk of these birds are located on the estuary between New Holland pier and Goxhill Skitter, ISG. The birds are attracted to a mixture of grain and animal foodstuffs spilt into the estuary during handling procedures at the New Holland Bulk Services terminal.

Feeding takes place mainly on a falling tide, one to three hours after high water, depending on tide height. Following bouts of feeding birds roost and loaf on the ebbing water and drift as far down the estuary as Immingham Docks and even Pyewipe from where they periodically fly back to the main feeding area. When an afternoon high tide in mid winter coincides with rough weather large number of pochard and tufted fly west to bathe and sometimes roost on the Barton and Barrow Haven clay pits. Some flocks of pochard move further west beyond Read's island but their final destination is unknown.



The number of pochard recorded has varied somewhat with the severity of the winter periods and may also be correlated with the degree of winter flooding on the Lower Derwent Ings. Low totals on the Humber appear to be correlated with extensive winter flooding on the Derwent washes. Such has been the recent increase in winter totals at New Holland that the estuary now qualifies as nationally important for the species. The two most recent mild and very wet winters, with extensive flooding on the Derwent, have seen a marked reduction in the estuary winter peak counts. Just 323 pochard were recorded in December 1998 well down on the peak of count of 2503 in the 1996/1997 winter. Birds were late arriving during the survey period with just nine present on the November count after which the December peak was short lived with only 143 recorded in February 1999. Subsequent count totals included birds present at Blacktoft and on the Barrow Haven/Barton clay pits where 26 broods were located and 45 juveniles fledged from 103+ which hatched.

Tufted Duck *Aythya fuligula*

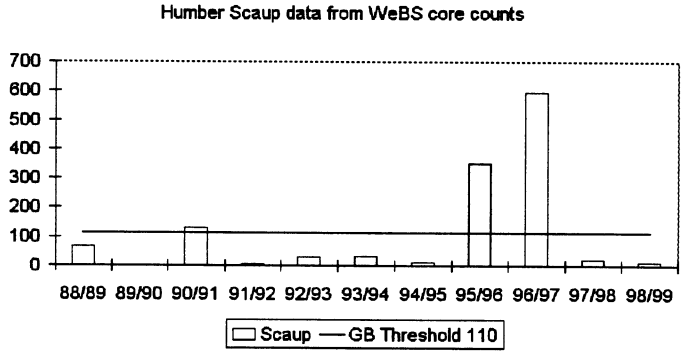
Great Britain 600 International 10000

Unusually the 1998/1999 winter peak count of this species exceeded that of Pochard, 359 against 323. Most of the winter total occur at New Holland and on the adjacent Barrow/Barton clay pits from whence the subsequent spring, summer and early autumn totals emanated.

Scaup *Aythya marila*

Great Britain 110 International 3100

This species occurs on the Humber in very variable numbers. A usually small wintering population in certain years is subjected to a sudden large arrival of birds, which have been forced out of regular wintering areas in the Baltic by a severe winter freeze. The estuary currently qualifies as



being nationally important for the species on the basis of two large influxes in the winters of 1995/1996 and 1996/1997 when respective peaks of 353 and 594 were recorded. Flocks of wintering birds are usually found in the mouth of the estuary off Spurn Bight and also at New Holland where variable numbers join the diving duck flock.

In such a benign winter as 1998/1999 it was not surprising that the number of scaup were low and the peak winter count amounted to just 12, all of which, were at New Holland in December 1998.

Eider *Somateria mollissima*

Great Britain 750 International 20000

With the exception of a party of ten present off Goxhill Skitter Ness on the January count all the other birds recorded were at Spurn where one to six were present in most months.

Long-tailed Duck *Clangula hyemalis*

Great Britain 230 International 20000

A single female was present on Barton pits in March and April.

Common Scoter *Melanitta nigra*

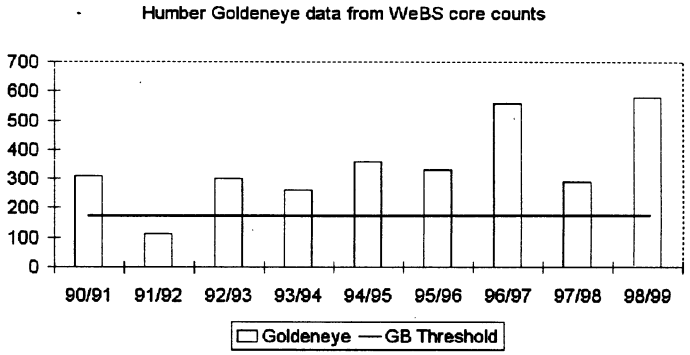
Great Britain 350 International 1600
During the review period a peak count of just 16 birds was recorded, all at New Holland, in January 1999. The estuary winter population varies considerably but appears to have fallen in recent winters.

When present wintering flocks are generally located off the coast between Donna Nook and Mablethorpe, in the estuary mouth, and occasionally at New Holland. At the latter site flocks usually arrive in November in association with the regular east west migration of the species which takes place along the Humber with birds sometimes staying for periods of up to five or six weeks but seldom have any birds lingered into January. It would appear from observations of specific flocks that they relocate to feeding areas off Grimsby Pyewipe and Grimsby Docks early in the new year period and may then remain there for several weeks.

In some years the cross-country passage brings large numbers into the estuary in the early autumn, July and August, with a later passage from late October through November. Flocks usually migrate at height and are easily missed but given periods of strong northerly winds in the late autumn good numbers may be temporarily displaced and arrive on the middle Humber. The autumn day maximum off Barton in 1998 was 500, recorded on the evening of November 1st, all of which had departed by the following day.

Goldeneye *Bucephala clangula*

Great Britain 170 International 3000



The majority of the Goldeneye recorded on the estuary in recent winters have been present in the diving duck flock off New Holland, sector ISG. In contrast to the numbers of the other two principal species in the diving duck flock, pochard and tufted duck, those of goldeneye have shown a more consistent increase with high numbers being maintained through the last two winters in spite of the very warm weather. This may well be a result of the species preferring coastal and estuarine environments for wintering rather than inland ones favoured by the other two species. Whatever the cause the continued presence of the species on the Humber has led to its qualification as being of national significance for the species.

During the 1998/1999 count series the differences between low and WeBS core count totals were largely irrelevant. Differences were often a result of differing count conditions rather than a reflection of any actual difference in the number of birds present. As usual the wintering population was late arriving with only 85 birds present by the November count date but quickly rose to the winter peak of 579 in December falling slightly to 442 by January and predictable reducing to 140 by March. During the latter part of the winter, February and March, a large proportion of the flock spent long periods feeding on pit 25 at Barton where a peak of 135 birds were recorded in March. The close connection between the Barrow and Barton clay pits and the New Holland wildfowl population, with birds frequently commuting between the two sites, makes it more practicable to include counts from the former sites in the estuary totals.

Smew *Mergellus albellus*

Great Britain 2 International 250

On the December count date six birds were present at New Holland, three on Fairfield pit and three in the diving duck flock. A further single was at North Killingholme pits in December with one January bird at Barton pits.

Red-breasted Merganser *Mergus serrator*

Great Britain 100 International 1250

Single records came from three sites in April, Goxhill Skitter, North Cotes and Spurn with one at Humberston and two Spurn in November.

Goosander *Mergus merganser*

Great Britain 90 International 2000

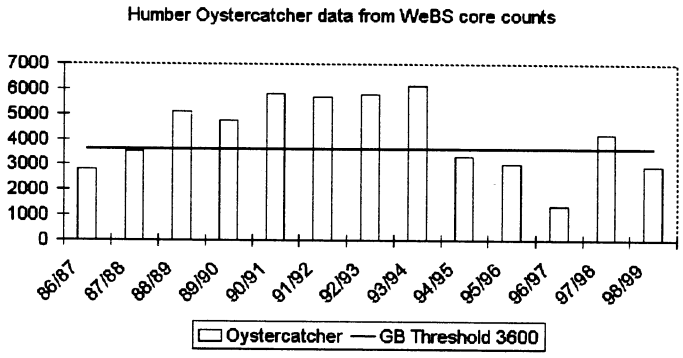
A small influx coincided with the November count when six birds were noted; three in the Read's island area and three between Barton and New Holland where one was also noted on the Humber in December.

Ruddy Duck *Oxyura jamaicensis*

The monthly totals were made up of birds counted in four area, the Barton to Barrow clay pits, Blacktoft, Faxfleet and Brough. Only a proportion of the birds on the Barton-Barrow pits appear on any counts. Census work there during the year revealed the presence of up to 65 birds in April and August.

Oystercatcher *Haematopus ostralegus*

Great Britain 3600 International 9000

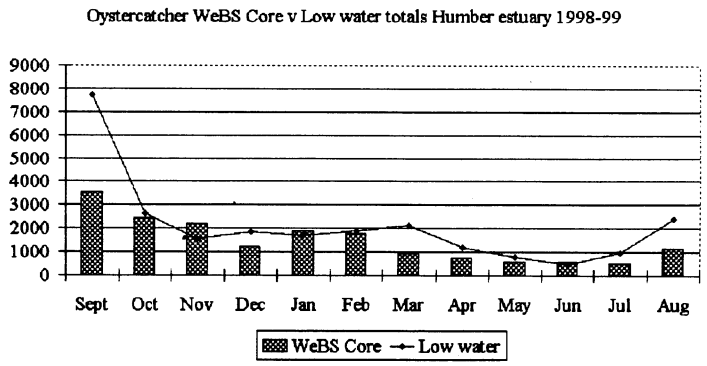


Although the Humber still qualifies as being nationally important for oystercatcher with the inclusion of counts for the 1997/98 winter period, the recent severe decline in the number of birds occurring on the estuary looks set to see its demise from this status. The last winter period, which produced high estuary totals, was that of 1993/94 when a maximum of 6140 birds was recorded. When this figure is removed from the five-year mean calculations, as it will be with the inclusion of the 1998/99 data, then the five-year mean for the estuary will fall below the qualifying threshold of 3600.

Declines in the species have been generally attributed to a decline in food abundance. Certainly the most recent two winter periods have not produced any hard weather which might have affected the species ability to feed on the estuary.

On the Humber the oystercatcher is mainly a bird of the outer estuary. The majority of the population at all seasons is to be found east and south of a line drawn from Cherry Cobb to Immingham Docks. The one exception to this general rule is the formerly increasing number of birds found in the environs of Read's Island during the spring and summer, March to July. These birds which breed in small numbers on the island and adjacent areas of the foreshore spread out to feed on the mudflats as far west as Winteringham Haven and east to Barrow Haven. There is also apparently a population of possibly immature non-breeding birds, which summer in the same area. During the count series the population at this location appeared to reflect the general decline in the species' abundance with a maximum of 71 birds located in May at low tide compared to recent counts of 90 to 100 individuals in the same area during the mid 1990's.

Unfortunately due to the incomplete nature of the count series from a variety of outer estuary sectors the two sets of data are not directly comparable. The maximum monthly figure from the two counts is therefore the best reflection of the estuary population in each month. Considering just the project data, which excludes the outer south shore WeBS core data, there was a very striking autumn peak in numbers, 7725 on the September 1998 low water count followed by a huge decrease to just 2626 in October and 2201 in November, 34% and 29% of the peak count respectively. From November the winter population never exceeded 2000 birds until 2119 were located on the March 1999 low water count. A relatively high population of non-breeding birds summered on the outer estuary with 569 counted in June compared to a total breeding population of just 26-29 pairs which were found during May to July. Of this somewhat disappointing total at least five pairs were present on Read's Island with an additional five pairs between Winteringham Haven and South Ferriby cement works. The peak count of seven pairs at Spurn Point and Easington lagoons, two to five pairs Sunk Island sector and scattered pairs at Tetney to North Cotes three pairs, Horseshoe Point to Grainthorpe two pairs, New Holland, Fairfield pit, and North Killingholme pits single pairs. The principal high tide roost sites for the species were located on seven outer estuary sectors with the number of birds using each location varying between months. Obviously the possible reasons for the variation in monthly occupancy of the different roosts are complex and varied. Tide height, prevailing weather conditions, the location of feeding areas in relation to the aforementioned variable environmental conditions, possible disturbance and the presence of additional passage populations being some of the obvious examples. It is beyond the scope of the present study to analyse the reasons behind the apparent variations.



The key roost sectors were Spurn NK, maximum 3000 September, Welwick area, NJ, maximum 50 January, Sunk island, NH, maximum 578 October, Cherry Cobb, NG, maximum 106 May, Pyewipe, MSA, maximum 136 January, Cleethorpes, MSC, maximum 360 August, North Cotes, MSE2, maximum 480 February and Grainthorpe Haven area, MSF, maximum 207 June. Clearly some roost sites were of importance throughout the year, NK, MSC and MSE2 while others were used during certain periods; NH and NJ mainly in autumn and winter and NG and ISF mainly in summer.

Low water data show that the sectors with the most consistent high tide roosts also acted as key feeding areas but that birds also spread outwards from these locations into adjacent sectors. While key sectors were used throughout the year there appeared to be temporal differences between some of the sectors which were of lesser importance. The latter sectors may however, hold a considerable percentage of the estuary total in certain months or seasons. The most important two sectors throughout the low tide count series were clearly NK, Spurn bight and MSF, Horseshoe Point to Grainthorpe Haven, which between them often held 66% of the estuary total; 37.2% and 28.8% respectively. The maximum feeding densities were also recorded on these two sectors at 3.68bpha NK September and 2.47bpha MSF August respectively. The Cleethorpes to Buck beck sector, MSC, also held consistent numbers of

birds with up to 23% of the estuary total and a mean of 10.9% over the 12 months. This sector held key numbers of individuals in November, December and May to August.

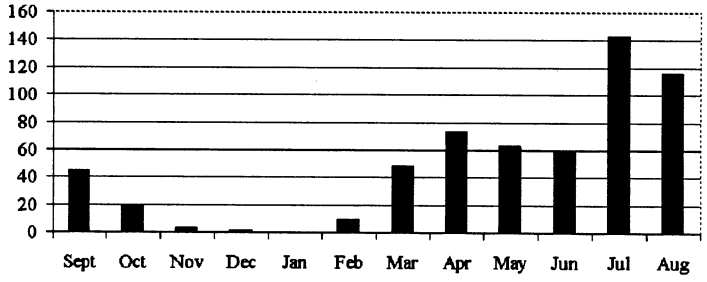
Sector NJ was important in winter but held few birds in spring and autumn whereas the next sector along the estuary NH held 3.2%-11% of the estuary total in all months with November and July standing out as exceptional. On the south shore MSA, Pyewipe, was most favoured in winter but also held good numbers of birds in March, April and October suggesting perhaps that it is frequented by passage birds. The next sector south, MSB was used in spring March to June when up to 3.7% of the population fed there but insignificant numbers were recorded at other seasons. Similarly sector MSE was most frequented in spring March to May and autumn July to October with clear peaks in importance in April, 16.2% and September, 11.6% of the estuary total. Away from the outer estuary the only sector to attract significant numbers of birds was ISE1, South Ferriby/Read's Island where 3.3% to 4.7% of the total were present in April to June. The vast majority of the birds present at this latter site had departed by early July. In most years a westerly passage of flocks of migrating oystercatchers is detected on the upper Humber during July and August with parties occasionally stopping off for short periods in the upper estuary sectors.

Avocet *Recurvirostra avosetta*

Great Britain 10 International 700

Avocets have long been scarce visitors to the Humber but were only added to the recent list of breeding species when a pair bred at Blacktoft Sands in 1992. It seems likely that this was the same pair, which had displayed and was thought to be nesting on Read's Island earlier the same spring. Since 1992 the Blacktoft population has increased to a peak of 28 pairs in 1999. There followed a consequent increase in the number of birds occurring further down the estuary, principally around Read's Island, mainly in the autumn months of July to September but odd birds also started to occur in winter and early spring. The second major boost to the species fortunes on the Humber followed the creation of a series of saline lagoons on the remnants of Read's island in the autumn of 1997. The joint RSPB, Lincolnshire Trust, Environment Agency project was quickly rewarded with the first successful breeding of Avocets in the historic county of Lincolnshire since 1837. A total of 13 pairs reared 39 young. This post breeding population was joined by many of the birds from Blacktoft leading to a record Humber count of 97 birds around the island on July 29th 1998. By the commencement of the low tide count project in September the flock had reduced to 45 birds and subsequently fell to 19 in October and just three in November. The first notable spring arrival saw 49 birds counted in March 1999 with 74 by April. The number of avocet recorded by the early counts in 1999 failed to adequately reflect the summer status of the species on the estuary so a brief breeding season summary is included for completeness.

Avocet Humber estuary combined WeBS core and low water count peaks 1998-1999



In early spring newly arrived birds move between the two main breeding sites at Blacktoft and Read's Island with some interchange of breeding and non breeding birds being evident throughout the summer in response to nest failures and second brood attempts. Post fledging there appears to be a trend developing for all of the Blacktoft birds, adults and young, to move down the estuary to join the Read's Island flock where to a peak estuary total occurs in July or early August prior to an extended departure from the estuary through the autumn. In 1999 at Blacktoft 28 pairs reared 24+ young with all the birds apart from one pair with two young having left by July 5th. Due to access problems at Read's Island a proper census of breeding birds was not possible but a minimum of 40 adults were present and 14 broods totalling 36 juveniles were seen off the Island in June and early July. Obviously there may have been other broods which failed to fledge but the total of 42 adults and 36 fledged young gave rise to a total population of approximately 152 birds. Thus a count of 134 adults/fledged juveniles and 4 unfledged juveniles made on July 6th around the Island was relatively accurate; some adults may already have left the estuary by this date. This total formed a new record estuary count. Avocets are still very concentrated and records away from these two sites are not common. As the population grows they will no doubt appear along other sectors.

The flock roosted on the island on spring tides and fed mainly on the mudflats to the south of the island and the vast expanse of accreting mudflats to the west and north-west of the island proper.

The recorded maximum feeding density of 0.49bpha in July does not clearly reflect the relatively restricted areas of the sector, ISD, which were actually used for feeding.

Little Ringed Plover *Charadrius dubius*

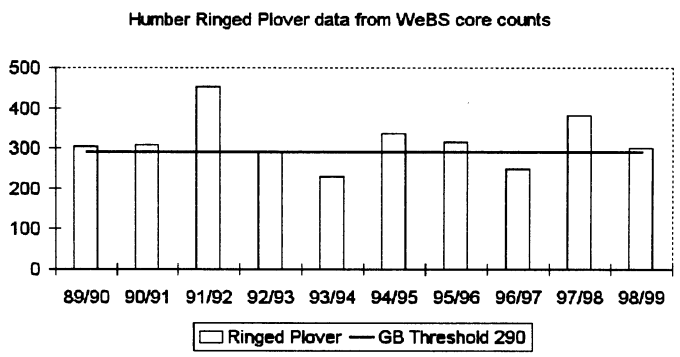
Great Britain ? International ?

Of the maximum of nine birds reported in July five were at Blacktoft.

Ringed Plover *Charadrius hiaticula*

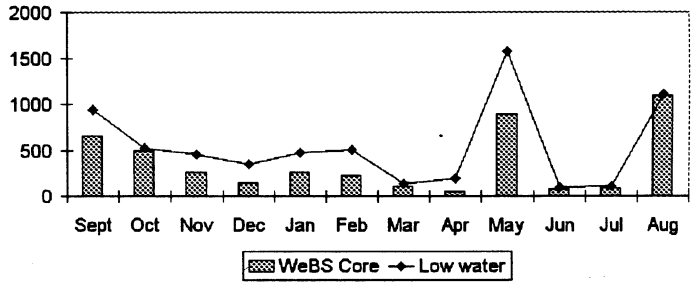
Great Britain 290 Passage 300 International 500

One of the major findings of the Humber low tide count project was the fact that four species, ringed and golden plovers, bar-tailed godwit and turnstone actually occur on the estuary in higher numbers than those recorded by the traditional WeBS core counts. In the case of ringed plover the low tide count total exceeded the WeBS core count in every month. Indeed if the low tide winter peak counts were maintained over a five season series and said figures substituted for the core count totals then it is quite feasible that the Humber would qualify as internationally important for the species.



The mean overall difference between the twelve sets of data was 36% in favour of the low water counts. The winter WeBS core count peak total of 301, including the outer south shore sectors, formed only 60% of the maximum low tide count in the same period and that total excluded the outer south shore. The key question therefore arises as to just why these additional birds are being missed on WeBS core counts. A simplified suggestion that birds mixed in with larger roosting flocks of small to medium sized waders, dunlin, knot and redshank, are difficult to detect seems likely to account for only a small proportion of the missing birds. A more viable scenario is that ringed plover flocks roost away from the usual sites used by other small waders and in localities which are either not accessible, visible or are not checked regularly by counters. Certainly flocks of birds are known to use areas of rough open ground, tipped chalk and stone sites and similar areas within dock complexes and industrial compounds such as factory sites. Such sites may be subject to occasional disturbance and are generally temporary in nature thus making the regular location of roosts all the more difficult. Away from the industrial areas flocks will roost on ploughed and newly drilled arable fields. Ringed plovers appear to regularly choose roost areas, which are not frequented by most other species and in areas where they occur in relatively low numbers the locating of such roosts can be difficult, and often a matter of chance. Birds feeding at low water by contrast are easy to detect even at great distances due to their distinctive jizz and feeding behaviour.

Ringed Plover WeBS Core v low water counts Humber estuary 1998-1999



The results obtained from the two count series clearly show that the low water figures present a more accurate reflection of the estuary population in all months. It is feasible that the population could have been higher than the totals located taking into account that some sectors were not counted in some months. Notable amongst these was a missed low tide count from Spurn in August 1999.

The general pattern of occurrence during the count series was much as would be expected for the species on the Humber. Ringed plovers occur as winter visitors with a limited, and thinly spread, breeding population, both of which are dwarfed by the large numbers of birds, which frequent the estuary on spring and autumn passage. Spring migration gets under way in late April but peaks in mid to late May extending into early to mid June in some years. Most of these birds are more northerly breeders heading for northern Scandinavia and the arctic. Many show characteristics of the race *C.h.tundrae*. Return autumn movements are under way by mid July with two or more peaks in August and September reflecting the passage of adults and later juveniles. Autumn passage continues into early October with wintering birds arriving by the month's end and into November. A relatively static winter population remains until February when British breeding birds start to depart to their breeding grounds.
Within the 1998/1999 low water count series the autumn peaks were obvious in August and September, albeit in different years, with a rapid fall to 56% of the September peak in October. The recorded wintering population fluctuated between 345 and 504 birds with a four month mean of 446 November-February following which numbers fell to a low of 139 in March. The spring peak of 1577 recorded in May exceeded the peak autumn count by 30%.

High tide roosts containing 20 or more birds were located in a restricted number of sectors in spite of the relatively wide spread of birds at low water. Certain sectors Pyewipe, MSA, Cleethorpes to Buck Beck, MSC and Spurn, NK held birds in most months while Read's Island, ISD produced 40 in December and January and obvious peaks of migrants with 445 in May and 340 August. The spring peak at Spurn totalled just 119 individuals whereas the autumn one in August numbered 458, 42% of the estuary monthly total. Other roosts were more sporadic in their occupation or detection. Notable monthly counts included 52 Cherry Cobb, NG September, 35 North Killingholme, ISJ October and November, 26 Saltend, NF November and 24 February, 49 Blacktoft, NA2 May and 30 North Cotes, MSE2 August.

Table 1. Principal Humber estuary high tide roost sites for Ringed Plover 1998-1999

	S	O	N	D	J	F	M	A	M	J	J	A
ISC-ISE1	0	30	0	40	40	13	7	3	445	1	15	340
MSA	42	92	61	74	98	54	51	29	92	0	4	119
MSC	370	240	76	8	73	108	2	3	170	0	9	130
NK	136	42	12	. 1	36	0	26	6	119	60	39	458

With the exception of a few sectors where Ringed Plovers were relatively regular in every month, one of the features of the distribution, in particular in winter, was the irregular appearance of flocks of 30+ birds in single sectors in sporadic months. A possible explanation is that preferred feeding areas in some sectors were only revealed at low water on spring tides hence affecting the distribution pattern in different months. Other factors such as weather conditions or disturbance may also have been involved.

Low water distribution around the estuary appears to show that some sectors are used primarily as winter feeding areas as well as hosting large passage populations while others are used only in winter or only by passage flocks. There is clearly great significance with regard to these findings in respect of estuarine planning and conservation.

On the upper estuary, west of the Humber bridge the key locality is made up of the three sectors, ISC, ISD and ISE1 which encompass the foreshore and mudflats between Winteringham Haven and South Ferriby Cliff including Read's island and its associated intertidal areas. During the project the winter population peaked at 74 in November 16.1% of the estuary total. Spring passage birds totalled 53 in March, 38.1%, and 350 in May 22.2% while the 360 in August formed 32.6% of the total. On the north bank sectors NB2 and NB3, Whitton to Brough produced a spring count of 58 in May, 3.7% but otherwise insignificant numbers. North Ferriby to the Humber bridge, ND, proved attractive to small numbers of Ringed Plovers in winter, four month mean of 15 with a maximum of 25 in December and held 30 individuals in September and 20 October.

Down stream from the bridge New Holland to Goxhill Skitter, ISG, revealed 28 and 38 birds in September and October with 48, 10.4%, in November but thereafter just 4 in January and none in spring and autumn. The adjacent ISH, Goxhill Skitter to East Halton Skitter, had a mean winter population of 22 birds in three of the four winter months and autumn totals of 30 October and 35 August.

The Ringed Plovers, which fed between North Killingholme Haven and Immingham Docks, sectors ISJ1 to ISK, appeared to be separate to the birds at Pyewipe, MSA, the next sector to the south. There was little observed interchange between the two areas. With a mean winter total of just 25 birds, November to January the appearance of 176 individuals at the former site in February seemed most unusual. This area produced few birds in spring but was again of considerable importance in autumn holding 159 birds, 17%, in September and 136, 12%, in August.

The remainder of the south shore sectors all held good numbers of Ringed Plover in certain months. From the differing occurrence patterns it seems possible to split the areas into two parts, Pyewipe to Buck Beck, MSA to MSC, and Humberston Fitties to Pyes Hall, MSD to MSF. The former area is clearly of importance for wintering birds with a January peak total of 299 birds forming 63% of the estuary total and a four-month mean of 180 individuals. During the spring passage period it lost some significance but 144 birds in May formed 9% of the total count. Autumn passage was again important with a three month, August to October, mean of 244 birds recorded and a maximum of 327 in August forming 30% of the total. In contrast the outer part of the south shore, MSDMSF, appears to act primarily as a feeding site for spring passage flocks and to a lesser extent autumn birds but had insignificant numbers during the winter. Peak spring totals of 642 May and 81 June formed 41% and 80% respectively of their monthly totals. Only MSF with 101 birds in August produced any notable autumn count.

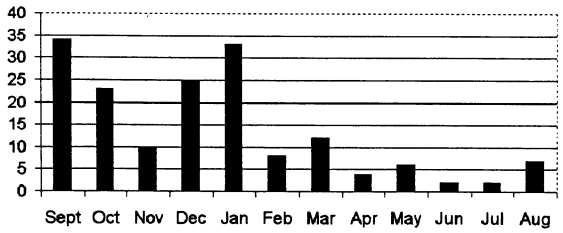
On the outer north shore Saltend, NF, turned in a high count of 240 birds in September, 25.6% of the total but then recorded less than 6% in any other autumn month. During the winter period 81 November and 60 February were noteworthy. Spring passage was insignificant in this sector. Missing counts from the various Cherry Cobb sub-sectors, NG1-NG6, make analysis difficult but a three month, November, December, February, mean of 36 is significant. Along with Sunk Island, NH, the easternmost part of Cherry Cobb NG6 held peaks of 169 birds in May and 31 in August, which combined with the 85 and 74 from NH, provided 16.1% and 9.5% of the respective month's totals.

Generally fewer birds were found in Spurn bight than were counted there at high tide possibly a reflection of the difficulty of locating a small number of a single species in such a huge expanse of inter-tidal mudflats. The peak count of 72 in May formed just 4.6% of that month's total whereas the 52 birds in July formed 48.6% of that month count.

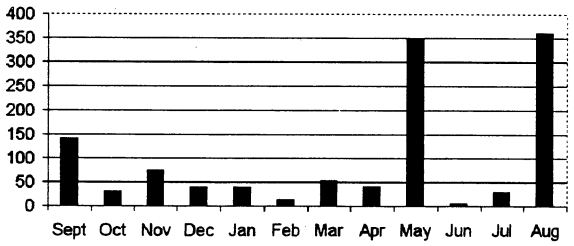
Breeding ringed plovers were only noted from five localities. Starting on the upper estuary two pairs bred between Winteringham and South Ferriby on shallow pools with an additional pair on the old South Ferriby Cement Works tip, which reared two juveniles. A pair laid four eggs on the Water's Edge site at Barton but deserted; between Immingham Docks and Pyewipe seven to eight pairs bred on the factory sites with two pairs at Harlow Chemicals known to have fledged four and three juveniles. At least three pairs bred between Tetney and North Cotes and the largest concentration by far occurred in the Spurn area with 13 pairs at Spurn and 20 Beacon Ponds.

Ringed Plover 1998-1999 Humber low tide count data by sector areas (note different scales)

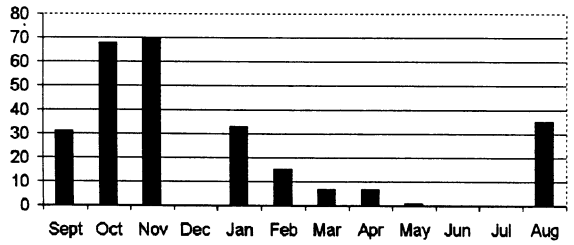
Ringed Plover combined sectors NC, ND



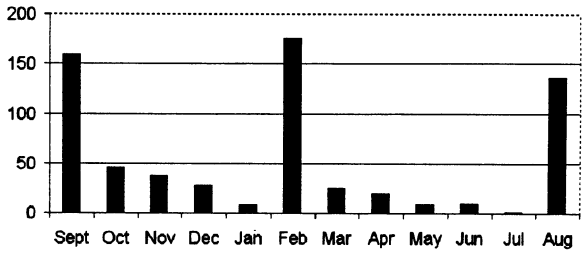
Ringed Plover combined sectors ISD, ISE1



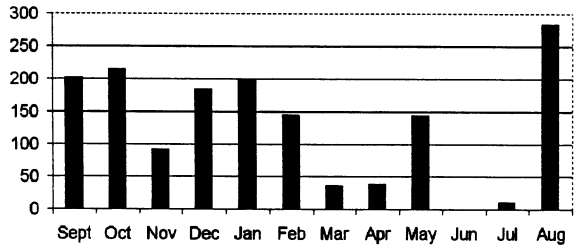
Ringed Plover combined sectors ISG, ISH



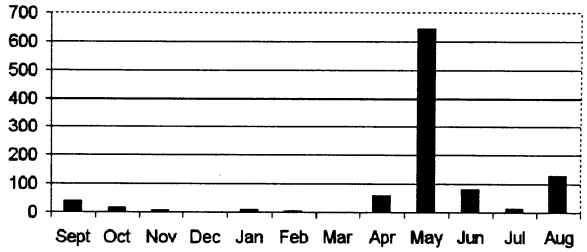
Ringed Plover combined sectors ISJ1,ISJ2,ISK



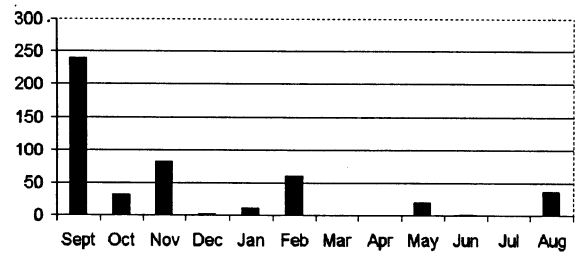
Ringed Plover combined sectors MSA,MSB,MSC



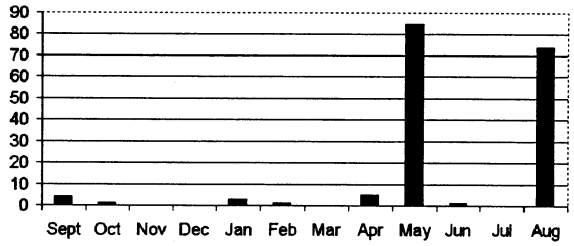
Ringed Plover combined sectors MSD,MSE,MSF



Ringed Plover sector NF



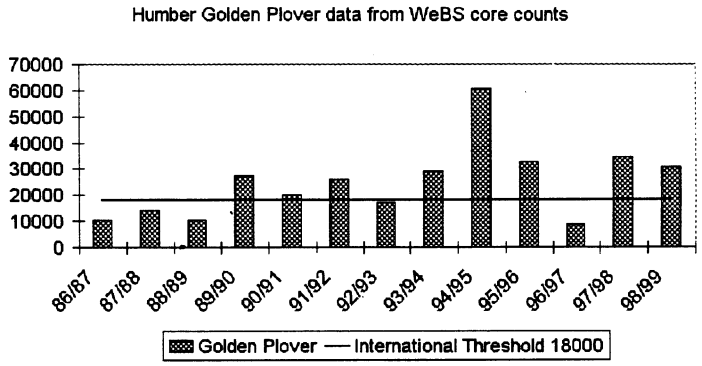
Ringed Plover sector NH



Golden Plover *Pluvialis apricaria*

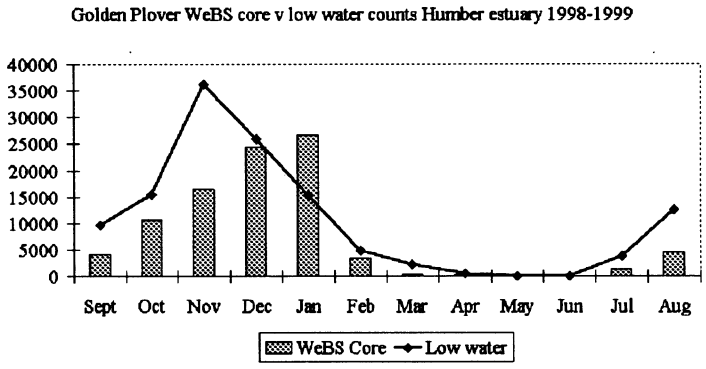
Great Britain 2500 International 18000

The Humber is the only estuary in the UK, which supports an internationally important wintering population of golden plover. The most recent five-year mean calculated from WeBS core count data being 34,615 compared with a qualifying threshold of 18,000.



At high tide, when WeBS core counts are undertaken the majority of the estuary population roost on fields adjacent to the estuary. The exceptions being areas on the south shore from Cleethorpes southwards where birds roost on the upper areas of the beach except on the highest of spring tides.

Golden plover and lapwing are the two species, which show least fidelity to the estuary. Both are prone to moving well inland to feed under suitable conditions and at various times of day in relation to a variety of environmental factors and thus WeBS core counts seem likely to underestimate the number of birds which use the estuary at low water. The results of the 1998/1999 low water counts demonstrated that this is indeed the case and with the exception of one count in January* 1999 all of the low water count totals exceeded the WeBS core counts in the same month. *(The January 1999 WeBS core and low water counts were undertaken on different weekends and this obviously affected the comparability of the data). Looking at the winter count data the highest low water count exceeded the peak WeBS core count by 9696 birds or 36%. Such a vast difference is obviously of considerable importance when considering true size of the estuary population.



Further analysis of the low water winter counts, November to February inclusive, using the WeBS low water count methodology produces a mean winter population of 21,767. Such a figure shows that the estuary would still qualify as being internationally important using stricter low water count criteria. It also has to be born in mind that by taking into account the full four-month winter period the mean figure is significantly reduced due to the inclusion of February counts when the population traditionally falls away.

The project low water count totals followed the general pattern of an early arrival of moulting birds in July, 3808, quickly building through August with a slight fall in September and another rise in October. These variations in autumn totals to some extent reflect the presence of different populations of golden plover. The figures are also known to be affected by the degree of feeding on ploughed and dragged stubbles and cultivated fields inland. As usual the

greatest arrival of wintering birds occurred in November with high totals being maintained through to January following which a departure led to a much-reduced count in February forming just 13% of the November peak. A further fall in numbers took place by March after which just 549 birds counted in April, 65 in May and 11 in June.

The species generally occurred at very high densities along favoured sectors with an average of 20.93 birds per hectare recorded. The density of birds in most sectors would be enhanced by counting smaller units however, as birds are usually concentrated in small parts of larger sectors. A good example of an exceptional concentration of birds occurred on the Trent falls sector in November when 206.25 birds per hectare were present on the small area of mudflats. On the Humber there is considerable interchange between flocks in different areas of the estuary, which tends to complicate any specific area based analysis. On the upper estuary major concentrations occur at the head of the estuary at Trent falls and Whitton Sand to Brough on the north bank and around Winteringham Haven to South Ferriby including Read's Island on the south shore. Birds certainly move between these major areas and as the accretion of mud and sand in the centre of the estuary between Winteringham and Brough has increased in recent months the interchange of birds seems to have increased. East of the Humber Bridge large numbers of golden plover frequent the area between New Holland and East Halton Skitter on the south shore and between Saltend and Sunk Island on the north bank. The latter concentration is usually the largest on the estuary regularly recording in excess of 10,000 birds in November/December. Again there is interchange between these two populations with birds roosting at Cherry Cobb flighting across the estuary to feed at Goxhill and New Holland. In addition flocks regularly move between Read's Island and New Holland in mid winter often in response to disturbance levels in a given area. Regular attacks by hunting raptors, disturbance by microlights and shooting are known causes of movements.

A further major concentration of birds is evident at Pyewipe with a more mobile population in the Cleethorpes to Humberston area, which generally suffers from high levels of human disturbance. On the outer south shore the area between North Cotes and Grainthorpe Haven also holds important numbers of golden plover. Finally on the outer north shore variable numbers are found in the Welwick to Spurn sectors this area being particularly favoured in the autumn and less so during the winter months.

Taking into account the complex nature of the movements of the species within the estuary itself and the additional movements of birds to inland feeding areas it is difficult to make sense of the monthly variations in the number of birds recorded by sector. However, bearing these constraints in mind there does appear to have been certain variations in sector usage throughout the count series.

By combining the low water counts from the upper estuary sectors, west of the Humber Bridge the overall importance of this area is revealed. Of particular importance were the total of birds recorded in October to March and July and August. Within the winter series an almost total absence in December, just 565 birds sandwiched between counts of 14,950 in November and 7853 in January, was quite remarkable. The sectors between New Holland and East Halton similarly revealed low numbers of birds on the same count while outer estuary sectors recorded high numbers. The low tide count was late in the day and with the short hours of daylight the anomalous count may have been a reflection of inland feeding or redistribution in accordance with other environmental factors. Birds were presumably still in the local area as

5430 were present on the WeBS core count at New Holland-East Halton and 4446 were counted on the upper estuary.

The New Holland to East Halton sectors produced significant low tide totals in September through November but not thereafter. Pyewipe by contrast was clearly of greatest importance during the winter period with no significant counts prior to December but from then significant numbers were present right through to April whereas autumn was a complete blank. Combining the totals for the remaining south shore outer estuary sectors shows that this region was of most importance during September to December inclusive. Surprisingly in January the Tetney to Grainthorpe sectors revealed the presence of 6,600 birds on the WeBS core counts but none at low water. Such are the anomalies raised by this species which habitually feeds inland as well as on the inter tidal areas of the estuary.

The aggregation of north bank low water counts from Saltend to Welwick (Table 2) shows just how important this area is for golden plovers throughout the autumn and winter from August to February.

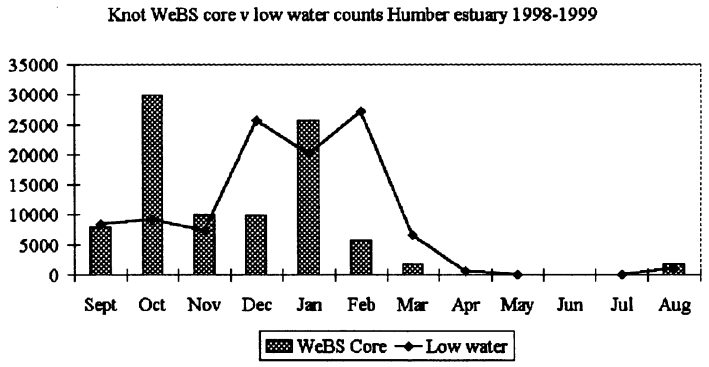
Table 2. The aggregation of north bank low water counts from Saltend to Welwick for Golden Plover 1998-1999

Sept	Oct	Nov	Dec	Jan	Feb	Jul	Aug
552	6345	16800	13650	2850	2032	940	4380
57%	41%	46%	53%	19%	43%	25%	35%

The low total for January reflects the lack of a count for the highly important Cherry Cobb sub sectors, where 12,358 birds were present on the same month's WeBS core count. With the exception of January this region supported 25%-57% of the estuary population between July and February.

Grey Plover *Pluvialis squatarola*

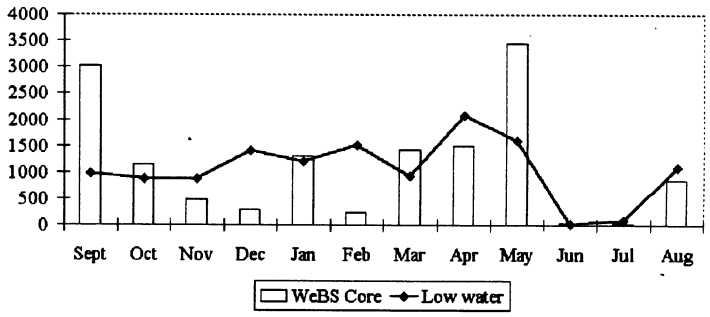
Great Britain 430 International 1500



More than any other species surveyed the counts of grey plover during the survey period seem to defy any sensible comparative analysis. This is all the more surprising as the species is limited in its estuarine distribution being recorded almost wholly on the outer estuary. Grey plovers do feed at lower densities than many other species, mean of 0.57 bpha, and they are spread over large sector areas at low water which may account for some of the discrepancy between the two sets of data. The differences are however, by no means constant with low water counts exceeding WeBS core counts in some months, by 500% in December, while core counts exceeded low water counts by 300% in October. Some high tide roosts could be escaping detection but for 1100 birds to disappear in December seems most odd. In

that month only an additional 532 were located on the additional outer south shore sectors, where birds could have been expected to roost. The lack of a core count from the Grainthorpe sector could account for a number of the missing birds as it is known high tide roost for the species.

Grey Plover WeBS core v low water counts Humber estuary 1998-1999



The peaks of the two sets of count data were both in spring, 2082 low water in April and 3443 WeBS core in May. The complete estuary WeBS core winter maximum was achieved in January when 1849 birds were located. This total is in fact higher than the most recent five-year mean and has only been exceeded by the exceptional 3368 recorded in the 1997/1998 winter. It is notable that this complete estuary core total formed only 61% and 54% respectively of the October and May passage peaks. This clearly demonstrates the additional importance of the Humber for grey plovers during the spring and autumn migration periods.

The lack of a complete set of counts from the outer estuary sectors on both WeBS core and low water counts, make meaningful analysis of the data very difficult. In addition to missing sector counts there are some apparent anomalies which are difficult to explain. The Welwick sector, NJ, produced a count of 2000 grey plover in September on that month's WeBS core count, 60% of the estuary monthly total and yet none were noted there in October or November, only 100 in December and none in January. On the same sector no grey plovers were noted at low water in September and October, just 13 in November but 600 in December.

An analysis of sector occupation at low water, where counts were more complete, reveals a clear line of demarcation, from Cleethorpes to Cherry Cobb, which splits the outer estuary, where grey plovers are mainly located, from the inner estuary where they are much less regular. On the inner estuary the only obvious occurrences of grey plover were at Pyewipe where six to 31 birds were noted during October to March and a good spring passage revealed a maximum of 304 in April and 116 in May. On the inner estuary only the Read's Island area with 29 October and 18 November held more than ten birds in any one month.

The four outer south shore Cleethorpes to Grainthorpe, sectors MSC-F, produced a baffling series of count totals which could reflect movements between adjacent sectors and the uncounted outer estuary sectors or even cross estuary movements. The Cleethorpes sector was the most consistent in holding good numbers of birds with notable peaks of 230 September and 547 April. Surprisingly none of these four sectors held more than 14 birds on the May count in striking contrast to the north bank sectors NG-K where the combined May count was 1425 birds. Totals in MSD never surpassed the 65 recorded in November and the adjacent sector MSE peaked at 96 in February and April prior to a stunning 591 birds present in August. The Horseshoe Point to Grainthorpe sector, MSF, had consistent good numbers of grey plover through the autumn, mean 108 August to October and winter, mean 177 November to February, but very few in spring. On the north shore the number of grey plover recorded at Sunk Island and Spurn, sectors NH and K, were most consistent with the exception of the missed counts on the latter sector. Sunk Island produced autumn, August to

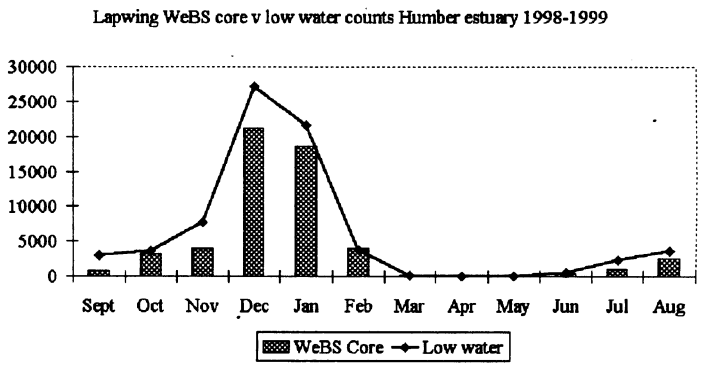
October, and winter November to February means of 179 and 446, the latter swelled by the season's peak count of 661 in February. Spring totals on this sector were lower, 150 April and 129 May by comparison with the adjacent sectors of NG, 124 April, 496 May and NJ 500 May. The reduced number of counts on the Spurn sector NK, revealed autumn and winter means of 204 and 261 but a massive 785 were present in April and 300 in May.

WeBS core counts were too fragmented for detailed analysis but several large high tide roosts were noteworthy. On the southern sectors the Cleethorpes area held the single highest gathering with 1030 in April and a three month mean of 734 during March to May plus 169 August and 150 September. The North Cotes sector produced an isolated total of 700 in March with 256 there in April but no other high tide roost count exceeded 90 birds.

On the north shore the bulk of the October total were located on the Cherry Cobb sector 780 with 541 also there in January and 1012 in May. Missed counts in December, February and March could have shown that this area is of enhanced importance for roosting grey plovers. Comparatively the roosts found on the adjacent Sunk Island sector were more sporadic; 136 in September, 106 October but 447 in January and a massive 771 in May. The pattern on the Welwick sector NJ was even more bizarre with 2000 recorded there in September but thence only 100 in December prior to a spring peak of 510 in May. Roosts at Spurn were more consistent but never exceeded the 305 found in September 1998.

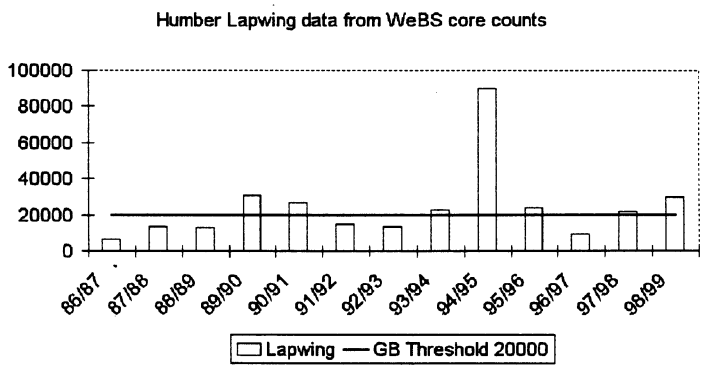
Lapwing *Vanellus vanellus*

Great Britain 20000 International 20000



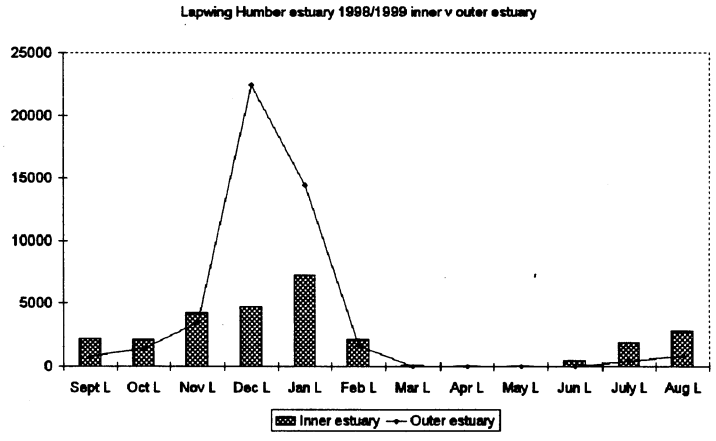
Lapwing and golden plover in many ways act as sister species within the estuarine environment. Both are prone to showing large fluctuations in the number of birds which are present on inter tidal areas during the winter months. These variations occur over periods of weeks, days and even during the same part of the tidal cycle. Such variations are a reflection of a variety of factors including the weather conditions, disturbance levels and the availability of food rich feeding areas adjacent to the estuary and further inland. The two species often congregate in the same areas of the estuary and will form mixed flocks, which however, invariably separate into single species groups in flight. The greatest number of lapwing are found on the Humber during the mid-winter period mainly November to December or January. In most seasons the bulk of these birds have departed by March. Hard weather may lead to a mass exodus from the east coast estuaries as birds move to milder western areas. Such winter movements may well produce a short lived early spring passage peak in late February and early March as birds stage on the estuary on the first leg of their return movement to their breeding areas. A vestigial breeding population remains around the Humber during the summer with a few pairs nesting on suitable remnant sites and adjacent fields. The size of this breeding population has reached a critical level. First arrivals of moulting non and failed-breeders occur from the last week of May with a substantial population often present by late June.

During the review period the low water count data largely reflected the above occurrence pattern. The total number of birds recorded rose substantially from September to November, 2993 to 7748, following which there was a massive arrival of wintering birds which led to a winter peak count of 27,160 in December. The population remained high through January but then plummeted to just 3778 in February, 17% of the January figure. A further fall by March left just 113 birds in that month with a spring population of 44-61 birds recorded in April-May. Returnees swelled the June count to 464 with a subsequent rapid increase to 3656 by August. The WeBS core count data also followed this pattern. The short lived winter peak no doubt reflected the lack of any sustained cold weather locally and on the adjacent continent. It was interesting to note that the peak count of lapwing lagged a month behind that of golden plover.



The most recent five-year mean obtained from WeBS core count data for the estuary, 33,653, is partly a reflection of the exceptionally high numbers of lapwing, 90,288, recorded in the 1994/1995 winter period. The results of the 1998/1999 surveys, for the whole estuary, reveal a winter peak of 28,899 birds in December, the highest total for five winters with the exception of the above mentioned 1993/1994 winter.

The majority of the low water monthly counts exceeded the respective month's WeBS core count. The peak low water count, 27,160 December, was 28% higher than the corresponding WeBS core count for the same surveyed area. As is the case with golden plover, it is only the wide upper shore areas of the outer south shore sites which provide suitable roost sites at high tide. WeBS core counts for the remainder of the estuary usually reflect the availability of suitable roost fields adjacent to the estuary count sectors. Low water distribution patterns therefore better demonstrate the areas, which are of importance to the species on the Humber. Even on those inter tidal areas which are frequented wintering flocks of lapwing often appear to be simply roosting or loafing at least during daylight hours. During the early autumn, July to September, flocks often spend greater amounts of time actually feeding on the inter tidal zone.



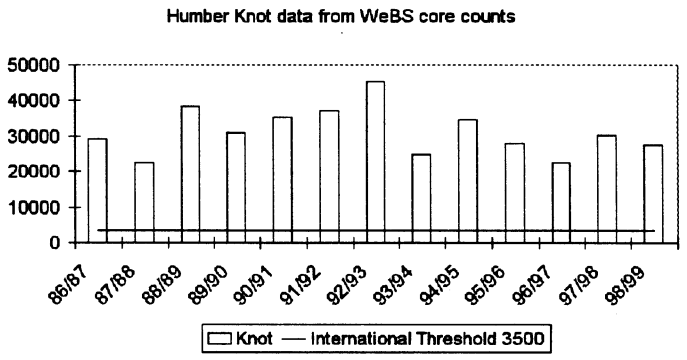
The low water distribution pattern clearly shows that the inner estuary is important for lapwing throughout the year. The outer estuary, from a line drawn from Saltend to New Holland, holds good numbers of birds mainly during the late autumn and winter period, October to February with individual sectors achieving particular prominence during odd months when the winter population is at its height. Overall distribution is however, widespread with most sectors producing counts of up to 100 birds occasionally throughout the year but particularly during July to January.

The largest concentrations of birds are found from South Ferriby and Brough westwards in the upper estuary. Here the number of lapwing recorded formed mean seasonal values of 35.8%, 90% and 65% respectively of the winter, spring and autumn total population. The lower winter mean is mainly a reflection of the different distribution pattern, which was evident in December and January; individual figures for November and February were 51.7% and 51.9%. The actual number of birds recorded on the inner estuary was very similar in November and December, rose by 54% to the January level before falling to 34% of the January peak in February. The conclusion from these figures is that the bulk of the large winter influx of lapwing, which occurred in December 1998, remained for the most part on the outer estuary with some penetrating the inner Humber a month after their initial arrival. With a mean of 90% of the estuary total located in the upper Humber in spring it is clear that the bulk of the wintering birds had departed prior to March 1999. Early autumn also showed that the bulk of the first arrival of lapwings was concentrated in the upper estuary with 69% and 75% of the estuary total found there in July and August 1999.

Analysis of the records from outer estuary sectors demonstrates the dominance of mid winter counts in addition to which higher numbers in September to November were a sign of the gradual build up of wintering flocks prior to the large influx in December.
Various sectors held significant totals of lapwing over slightly differing periods. The New Holland to North Killingholme area produced respective winter counts amounting to 18.6%, 18.1%, 20.9% and 10.5% of the total during November to February. The Pyewipe sector was of particular prominence in December 23.2% but less so in January 12.4% and February 6.9%. Similarly the Humberston to Tetney area had just one good count of 3000 in December, 11% of the total, while the next area south, North Cotes to Grainthorpe held 11.7% October, 10.3% November but just 4.2% December and 5.1% January. On the north bank the Saltend sector produced a similar pattern to Pyewipe with 11% December and 6.9% January. Some key months were not counted at Cherry Cobb but even so a maximum low water count of just 325 in December was in marked contrast to a WeBS core count of 6010 made there in January when unfortunately there was no low water count. The Sunk island sector also produced some notable lapwing numbers with 6.7% December and 7% January, of the estuary total but the outer two north bank sectors J and K, Welwick area to Spurn, held few birds even during the winter peak. Even during the mid winter peak these combined sectors which cover a huge area produced only 2.9% and 3.3% of the estuary totals in December and January.

Knot *Calidris canutus*

Great Britain 2900 International 3500

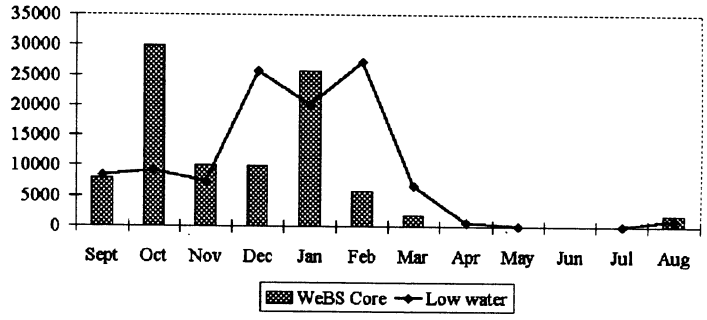


Analysis of past WeBS core data for the Humber shows that the most recent five winters have recorded a very similar peak count in the range 22,579 to 34,663 with a mean of 28,060. The 1998/1999 entire estuary WeBS winter core peak count of 27,355 was very close to the five-year

mean but was exceeded by the October total of 29,992. The low water maximum of 27,193 was recorded in February 1999.

As a species, which is traditionally concentrated on the outer estuary, the incomplete series of counts from certain outer estuary sectors affected the comparability of the two sets of data. The best indication of the true size of the wintering population was provided by the low water counts for December to February inclusive, which produced a mean total of 24,380, 90% of the maximum WeBS core count. The wintering population fell by 75% between February and March and by a further 92% from March to April. May, June and somewhat surprisingly July turned in only vestigial numbers of knot with a maximum of 45 birds prior to a small arrival in August when 1874 were found on the WeBS core count.

Knot WeBS core v low water counts Humber estuary 1998-1999



While the September WeBS core and low water counts produced very similar results a core count of 15,000 birds on the Welwick sector, NJ, in October meant that month's WeBS core count totalled 29,865 while the low water figure was just 9216. This extraordinary count was followed by broadly similar figures obtained from counts in November, 10,020 core against 7293 low water. Indeed the relatively low number of birds recorded in November leads to a suggestion that the bulk of the wintering population were late in arriving on the Humber in 1998.

High tide roosts located on WeBS core counts during 1998/1999 were exclusively on the outer estuary from Cherry Cobb to Spurn on the north bank and from Cleethorpes to Grainthorpe on the south shore. From the data obtained it would appear that the bulk of the outer estuary population roosts in one location in most months but that the specific location of the main roost varies and may be on either the north or south shore. In September and October 93% and 69% of the Humber knot were found roosting on the north bank between Sunk Island and Spurn with 9000 birds, 30% of the October figure being found at Cleethorpes. The south shore sectors, from Cleethorpes to Grainthorpe, proved to be the most important roosting area between February and April recording 75%-100% of the estuary totals. Additionally in the early autumn knot preferred to roost in the same area with 91% of the total located at Cleethorpes alone in August 1999.

Although parties of knot are known to move further into the estuary during periods of severe weather, when the outer flats are frozen, the mild winter of 1998/1999 obviously led to no such relocation. In fact low water distribution was very similar to that shown by WeBS core counts with some spread of birds outwards from their roosts into adjacent sectors which offered suitable feeding. The Pyewipe sector held a maximum of 290 birds in October 1998 but the intervening sector between there and Cleethorpes, MSB held a maximum of just 95 in December. In general the Cleethorpes to Buck Beck sector held much larger numbers of knot at high water than low (Table 3), the exception being December when only 1390 birds roosted at high tide but 5030 were found feeding at low water.

Table 3. Numbers of knot in the Cleethorpes to Buck Beck sector, both high and low water 1998-1999

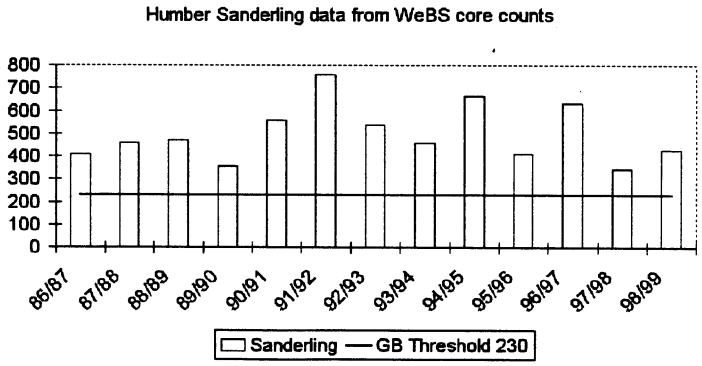
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Aug
WeBS	570	9000	6000	1390	510	4600	1000	1700
Low	600	155	1784	5030	1678	291	450	408

While there may well have been movements between south shore sectors MSC to MSF and the additional outer estuary sectors only counted for WeBS cores, only about 2000 birds were found on these outer sectors in mid winter. In December in particular 82%, 8046, of the knot counted on the WeBS core count roosted on the outer north bank sectors NH to NK but as shown above 5030 birds were feeding at Cleethorpes at low water. It is thus safe to conclude that there are large inter-tidal movements between feeding and roosting areas on the north and south shores of the outer estuary. With the obvious exception of the 6280 birds located on the December low water count, spread between the south shore sectors MSC to MSF, Cleethorpes to Grainthorpe, no more than 2866, January, were found there during the survey. Note however, that 74% and 83% of the respective reduced April and August low water totals came from this area. At low water in general the outer three north bank sectors Sunk Island to Spurn clearly held the majority of the feeding knot from September through to March. The actual number of birds recorded on each individual sector varied monthly. The Sunk Island sector had a maximum of 35% of the estuary population in February and 24% in March but only 7% in December and 6% in January. The adjacent Welwick sector by contrast held 68% in December, 45% January, 28% February and 17% March. Spurn bight was not counted in November and December but had 65% of the September and 60% of the October count totals.

Sanderling *Calidris alba*

Great Britain 230 International 1000

As a species which is most at home on sandy beaches and rock strewn shorelines the sanderling is mostly confined to the outer southern shore of the Humber estuary and the northern shore at Spurn. Exceptions do occur, particularly during the spring migration period in late May and early June, when small parties appear with moderate frequency on a wider variety of sectors on the middle and upper estuary. The spring passage is usually very concentrated with the bulk of the population passing through the estuary within a few days in late May or early June. It is thus more often than not the case that WeBS core counts fail to coincide with this restricted period of peak occurrence. During the 1998/1999 count series there were obviously no count dates which recorded even moderate numbers of spring migrants indeed the figures suggest that the spring passage in 1999 was one of the worst for many years.

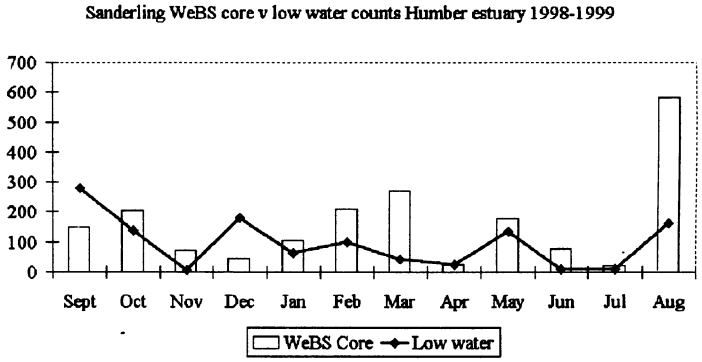


As the outer southern shore sectors, from Grainthorpe southwards, were not included in

the present surveys and this is the area where the bulk of the Humber sanderling occur, it was no surprise to find that the species was not recorded in very high numbers either on low water or WeBS core counts. Even with the addition of the extra birds recorded from the outer sectors on WeBS core counts the total estuary counts were at the low end of the most recent WeBS core five-year means for the Humber. The peak of 426 birds noted on the March WeBS core census was below the five-year mean of 504 calculated in the most recent WeBS report, but was up on the 1997/1998 peak of 345. A calculation of the next five-year mean, including 1998/1999 data reveals a new figure of 497, which easily maintains the Humber's national importance status for sanderling.

The August WeBS core count of 581, which excluded the outer south sectors, was the highest count of the series. Spring totals were particularly disappointing with just 312 on the total estuary WeBS core count for May and only 136 on the same month's low water count. An incomplete series of WeBS core counts from the southern sectors could have had a significant effect upon some of the monthly totals.

The peak low water count total was just 278 birds recorded in September 1998 while 181 was the winter peak. The only other low water counts to top a 100 sanderling were 163 in August and 139 October.



The only two sectors to produce regular high tide roost counts were Cleethorpes and Spurn. These two sectors held 578 of the 581 peak total recorded in August 1999.
Low water distribution was to all intents and purposes restricted to the five south shore sectors, between Grimsby Dock tower and Grainthorpe Haven, and Spurn.
Isolated small parties were also counted in May on other sectors notably North Killingholme ISJ1, 6, Pyewipe 14 and Sunk Island 17. Maxima on individual sectors were 45 Grimsby Docks, MSB October, 116 Cleethorpes December, 88 North Cotes August and 181 Horseshoe Point to Grainthorpe September. There appeared to be no discernible pattern to the occurrences which could have been influenced by birds moving between sectors under review and those of the outer south shore which were not counted.

Little Stint *Calidris minuta*

Great Britain ? International 2100

An expected autumn presence revealed 80 birds on the September 1998 low water count but otherwise just single birds in October, November 1998 and August 1999. Of the 80 birds noted in September, 40 were in the Read's island area with a further 21 at Blacktoft, 12 between North Killingholme Haven and Immingham Docks and the remainder widely scattered.

Curlew Sandpiper *Calidris ferruginea*

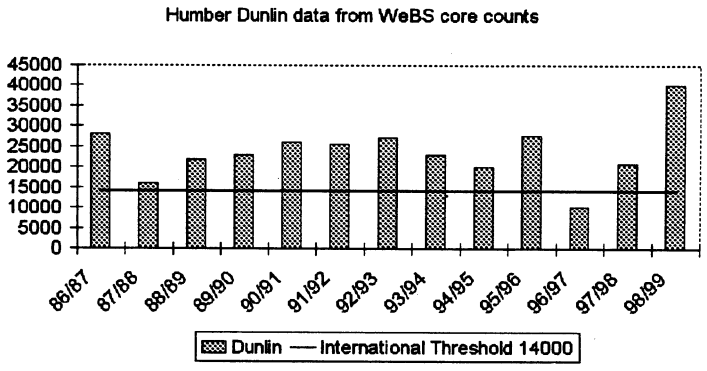
Great Britain ? International 4500

An associated arrival of juvenile curlew sandpipers along with the last species led to a September count of 60 birds at low water. Of these 18 were around Read's island, 5 at Blacktoft and 10 Sunk Island with the rest widely spread.

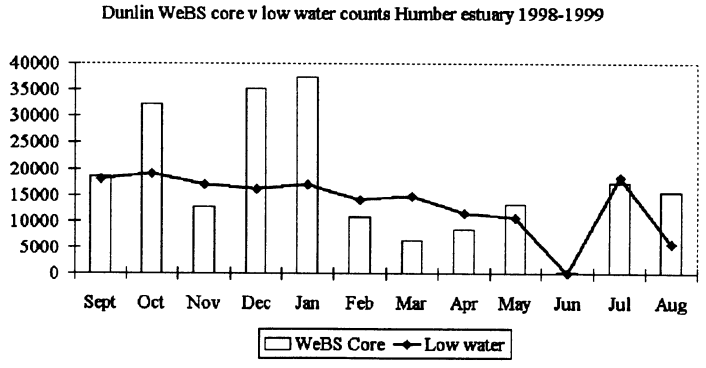
Dunlin *Calidris alpina*

Great Britain 5300 International 14000

Along with redshank, dunlin proved to be the most widespread species around the Humber at low water. This was not really surprising considering the versatile nature of the species' feeding requirements and the type of substrates exploited. After lapwing and golden plover the recorded feeding densities of dunlin were some of the highest on the estuary. Considering only those sectors where densities in excess of 0.1 birds per hectare were recorded a mean density of 6.33 birds per hectare can be calculated from peak sector densities over the Humber.



The 1998/1999 WeBS core count series produced a complete estuary peak winter count of 40,112 in January 1999. This figure was almost twice the most recent five-year mean for the Humber exceeding the 27,600 by a staggering 45%. It should be noted that this peak count in January 1999 and the equally impressive December total of 35,128, were both largely a result of the exceptional records of 20,000 and 25,000 birds noted on the Welwick, sector North J, in these two months. A record of 15,000 dunlin on the same sector in October 1998 also swelled that month's WeBS core count to 32,310. Overall the WeBS core series produced some unusual variations with an extreme low of 6322 in March and a November total of just 12,644 sandwiched between two months with counts in excess of 30,000 birds. The WeBS core counts appeared to reveal a spring passage in May but this was not reflected in the comparable low water census. Both sets of data did however, agree on the lack of dunlin on the estuary in June with a maximum of just 96 birds present. Taking into account the lack of a low water count at Spurn, where 9200 dunlin were present at high tide in August, the two sets of early autumn counts for July and August, were very similar.



In direct contrast to the large variations in the WeBS core counts, the low water totals were very similar from September right through to May varying by just 8507 birds, 10,633 to 19,140. The winter, November to February, low water mean of 16,122 still exceeded the level of international importance.

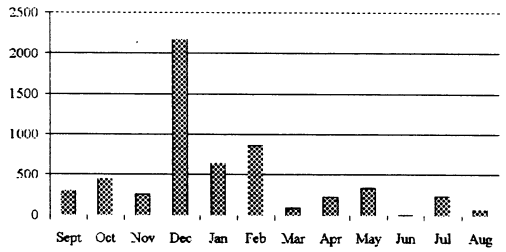
This apparent consistency in the number of dunlin recorded at low water does however, fail to take into account the variation in coverage on some of the outer estuary sectors in certain months. Taking the combined totals from the north bank sectors from Saltend, NF to Spurn NK, the summed low water totals of dunlin, for the months with full coverage, amounted to between 44% and 92% of the estuary totals. The importance of this area of the estuary to dunlin is clear but analysing periodic differences between sectors is impossible due to missing counts. Those sectors with a full set of data, NF and NH, do show distinct differences on seasonal occurrences as shown in the accompanying charts. The Saltend sector, NF, showed a winter dunlin peak with signs of a spring passage while Sunk Island, NH, revealed a more complex pattern with late autumn and spring peaks but fewer birds in mid winter and early autumn. On the July low water count a massive 15,300 dunlin were present in Spurn bight, 83% of the combined estuary total.

On the inner estuary numbers on the combined north banks sectors, from Blacktoft to Hessle, NA2 to ND, did not exceed 334 apart from during the three month mid winter period of December to February when an exceptional 2170 were logged in December, 642 January and 862 February. On the south bank the dunlin which feed around Read's Island tend to roost on the island at high tide and thus form what amounts to an almost self-contained population. In this area the number of dunlin were relatively consistent during September to March with a peak of autumn passage birds in October and a discernible winter peak in December. Surprisingly numbers fell below 1000 in April and to 600 in May failing to reflect any sign of a spring passage. It is often the case though that the departure of wintering birds in March is compensated by the arrival of spring passage birds in April. The scale of the spring migration in 1999 does however, appear to have been on the low side for recent years. The large early autumn arrival on the outer estuary, see Spurn July and August, was reflected in a count of 1094 in the Read's Island area in July but was followed there by a rapid onward movement of dunlin flocks leading to a much reduced August total.

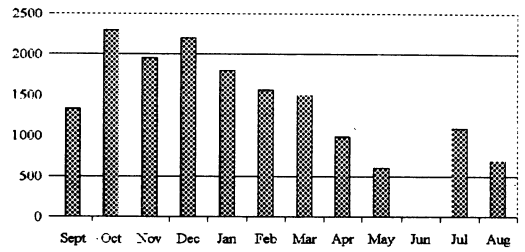
The attached sheet demonstrates the differences in occurrence patterns of dunlin recorded in differing parts of the estuary where full series of counts were undertaken. The differences in pattern are evident within the charts. Some sectors and areas are obviously of importance in most months, such as Read's Island, sectors ISC to ISE1, Pyewipe MSA and the non-SPA sectors ISI to ISK. Other areas showed prominence in the winter period but had fewer birds at other seasons such as ISF and NF and ISG and ISH.

Dunlin 1998-1999 Humber low tide count data by sector areas (note different scales)

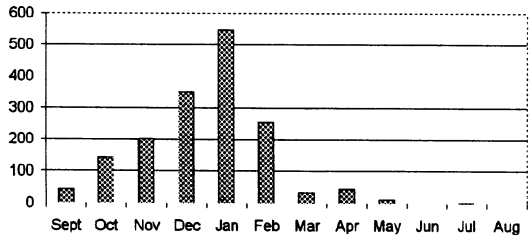
Combined sectors NA2-NE



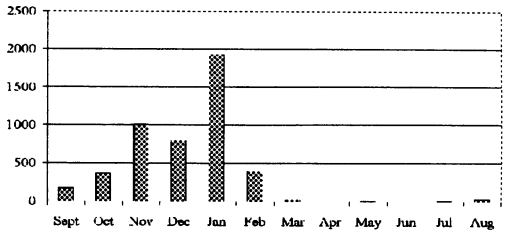
Combined sectors ISC,D,E1



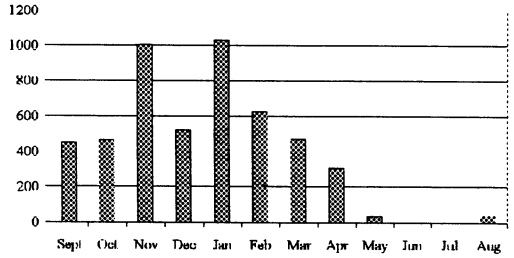
Sector ISF



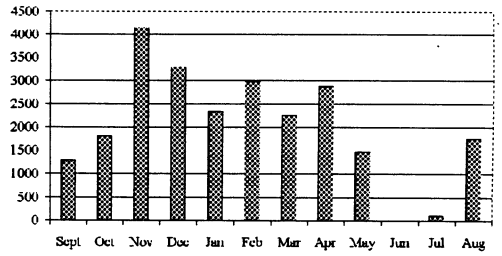
Combined sectors ISG,H



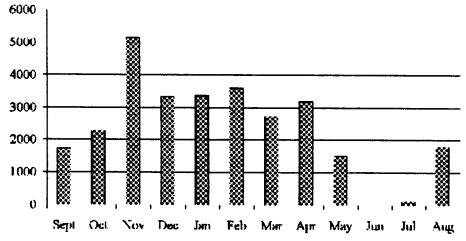
Combined sectors ISI-K



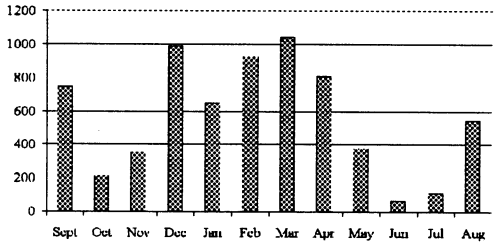
Sector MSA



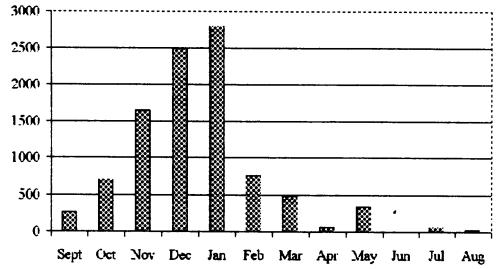
Combined sectors ISI-MSA



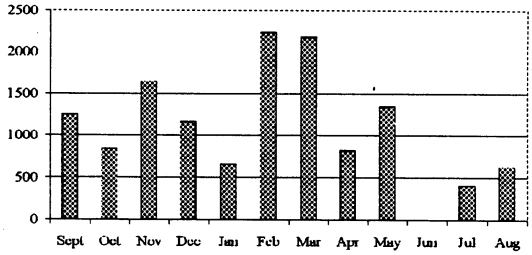
Combined sectors MSC-MSF



Sector NF



Sector NH



Purple Sandpiper *Calidris maritima*

Great Britain 210 International 500

A single bird accompanied a flock of roosting dunlin on the shore by Goxhill tilery on the November core count. Elsewhere the regular wintering site at Grimsby Docks-Cleethorpes produced a single bird in December and two during January to March.

Ruff *Philomachus pugnax*

Great Britain 7 International 10000

The usual autumn passage peak was followed by a typical token winter presence with just one to four birds noted during December to March. The only exception being two flocks of 17 at North Killingholme and four at Cleethorpes both located on the February count. Both the low water and WeBS core peak counts occurred in October, 104 and 176 respectively but 88 and 95 were recorded in September and 68 and 35 in August. Of the September and October low water totals, 55 and 85 were at Blacktoft where most of the July and August birds were also reported. Other localities which held in excess of five birds were Read's island area on the 9th October, New Holland on the 9th October and Sunk Island on the 23rd of September. On the WeBS core counts Blacktoft again dominated the autumn figures with 57 in September, 97 in October and 34 in August. The only other site recording significant numbers being Sunk Island with 23 in September and 14 in October.

Jack Snipe *Lymnocryptes minimus*

Great Britain ? International ?

This cryptic species is only located through chance encounters with flying birds or by flushing birds from their chosen marshy feeding areas. The numbers occurring round the estuary are undoubtedly higher than records indicate. During the survey period one was found at Spurn in September with three there in October and four were flushed from a small wet area at Pyewipe in March.

Common Snipe *Gallinago gallinago*

Great Britain ? International 10000

Few common snipe are usually recorded by WeBS core counts due to their skulking behaviour and choice of habitat. Those which were noted on WeBS core and low water counts in the survey were often to be found feeding on the lagoons at Blacktoft or were seen in flight having flushed from feeding areas on saltmarsh and upper shore pools. Totals recorded were generally low with less than 31 birds apart from during March and April when 94 and 50 birds were located. During this period an exodus of British wintering birds often leads to an accumulation of birds on the east coast. Of the 94 and 50 birds in March and April, 44 and 44 were at Blacktoft with the majority of the remainder located on a fortuitous walk over some marshy ground at Pyewipe which also revealed the presence of four Jack Snipe.

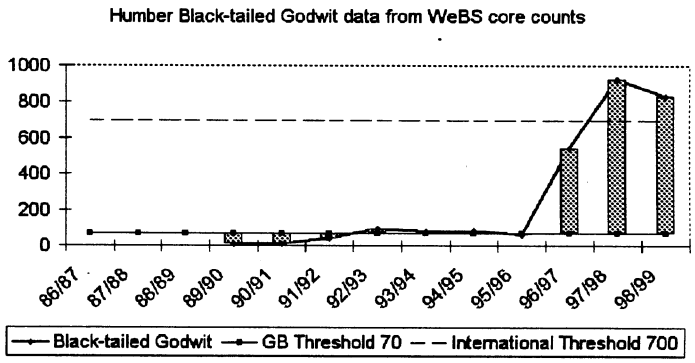
Black-tailed Godwit *Limosa limosa*

Great Britain 70 International 1000

Two WeBS counts were recorded for November 1998. The higher of the two at 830 was the figure recorded. This duplication occurred because the Pyewipe MSA WeBS core count had to be done on a different date to the designated core count date when the North Killingholme pits, sector ISJJ, was conducted. The wintering flock of black-tailed godwits unusually roosted at the two separate localities on the two dates.

One of the recent avian success stories on the Humber estuary has been the meteoric rise in the totals of passage and wintering black-tailed godwits being recorded during the 1990's. The species has achieved the status of national importance on the Humber and looked set to become internationally important within the next few winters. An imminent review of the qualifying threshold levels for the population concerned however, looks set to increase the threshold considerably in the near future.

The majority of the black-tailed godwits, which occur on the Humber, especially in winter, are considered to be of the race *L.l.islandica* that breeds in Iceland and on a few northern Scottish isles. Ringing recoveries in the form of sightings of colour ringed birds confirm the origins of some birds but also suggest that a few birds of the nominate race are also involved. Autumn passage birds first appear in late June building rapidly in numbers through July and August to peak in September and October. A fall in numbers then follows to a relatively stable wintering level, which is maintained through to January or early February prior to a departure of wintering birds in late February and March. While some wintering birds occasionally linger into April there is also a fairly regular spring passage flocks of *islandica* during the month. Birds seen in May are more likely to be nominate continental birds prospecting for breeding sites. The species has bred on the Humber on a few occasions. Ringing has also shown that Icelandic breeders, in some cases, move south to moult on the Wash prior to returning to the Humber for the ensuing winter. In a reversed movement in early spring some birds move south from the Humber to areas in East Anglia, notably the Ouse and Nene Washes and the north Norfolk coast, before departing for Iceland in April.

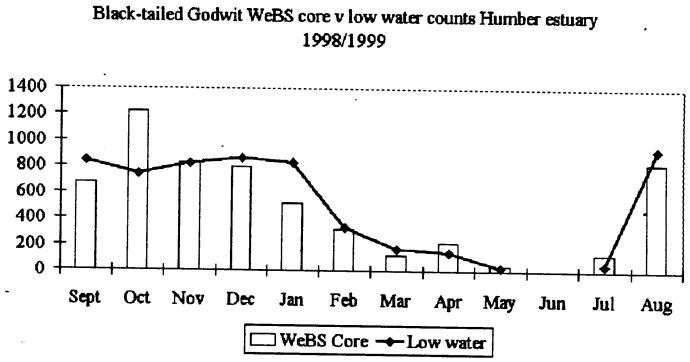


On the Humber a pattern of occurrence has developed as the population has grown in number. Early arrivals congregate in three main feeding areas, the upper estuary between Blacktoft and Read's Island, the north shore from Saltend to Cherry Cobb and along the south shore from East Halton Skitter to Immingham Docks. The former group, which has peaked at up to 190 birds in recent autumns, roosts on Read's Island or at Blacktoft at high tide. The latter two groups all roost at North Killingholme Haven pits on all but neap tides when some of the north bank birds stay within their feeding areas. As the autumn progresses the upper estuary population appears to gravitate to the Killingholme area after mid August. During the peak autumn months of September and October almost the entire population roosts at North

Killingholme pits often spending several hours there either side of high water. These birds then spread out to feed on the north bank around Cherry Cobb and along the south shore as far down river as Pyewipe. In general from November onwards the wintering flock then spends most of the high and low water periods feeding and roosting on the Pyewipe sector MSA. It has been noteworthy that during late 1999 however, most of the flock have roosted at Killingholme and have been feeding on the north bank sectors. Could this be another change of pattern taking place in this dynamic population?

The results presented by the 1998/1999 survey largely conformed to the expected pattern. Taking the overall monthly maxima from both sets of counts, the autumn peak of 1223 was recorded in October 1998 with a subsequent fall to a mean winter population of 841, November to January. An obvious departure following the January counts left only 332 birds in February and 168 in March. Signs of a small spring passage raised the April total to 219 followed by a sudden drop to 42 in May and just 3 in June. The first signs of an arrival of autumn birds were the counts of 128 in July and a sudden rise to 934 in August which was in fact the series low water count maximum.

Low tide distribution saw the early autumn congregation in the upper estuary, 43 in July and 131 in August, the former 88% and the latter 14% of the respective month's totals. By September only 9% of the population were in the upper estuary and no more than 28 birds were recorded from there until a spring arrival at Blacktoft revealed all 29 of the May low water birds and 35 of the 42 birds noted on the same month's core count.



The importance of the non-SPA sectors centred on North Killingholme pits, ISI to ISK, was demonstrated by the number of black-tailed godwits found feeding there at low water in August and September. In August 1999 48% of the estuary total fed on these sectors with a further 36% being found across the estuary at Cherry Cobb. In September 1998 86% of the low water total of 844 birds fed on the above mentioned south bank sectors. By the time of the October count most birds were feeding on the Pyewipe sector, MSA, but the high tide roost split between there and North Killingholme. The pattern of winter roosting and feeding at Pyewipe was then followed from November through to January but on the latter month's WeBS core count 478, 93% of the total roosted on the Sunk Island, NH, sector. Obviously some birds were lost as 828 were found feeding at Pyewipe at low water. Sunk Island was again a chosen roost site in April when 88 of the 219 total were noted there. The 126 at Pyewipe on the same core count accorded well with the 140 noted there at low water and thus the extra birds at Sunk Island were presumably a spring passage flock.

The species maintains a very restricted distribution on the Humber with just eight sectors holding in excess of 20 birds in any month. The pattern of distribution as described above shows how reliant the species is on certain sectors of the estuary for feeding and roosting.

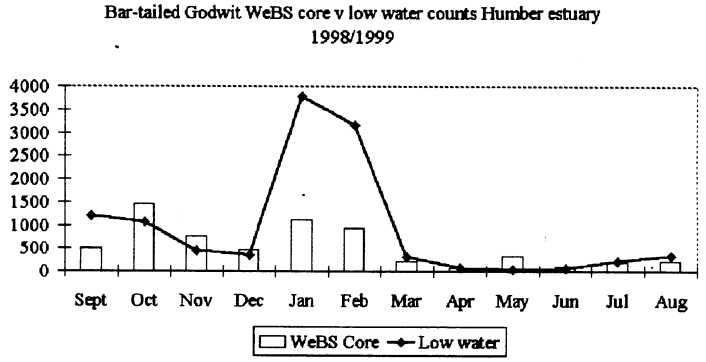
Bar-tailed Godwit *Limosa lapponica*

Great Britain 530 International 1000

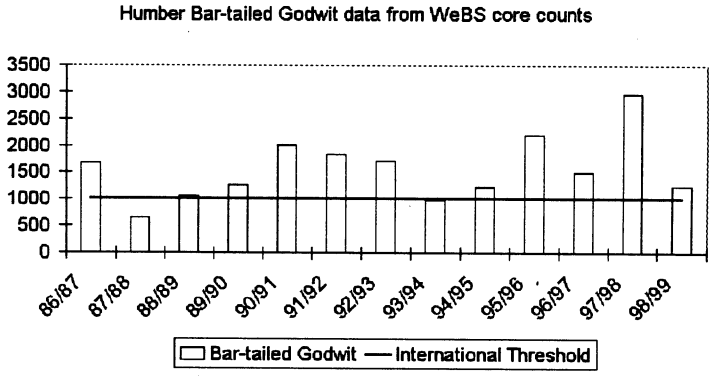
The British wintering population of bar-tailed godwit fluctuates widely between years (Cranswick et al. 1999). These variations are thought to be a result of variable breeding success, noted in most arctic breeding waders and wildfowl in particular Brent geese, and to the severity of winter weather in the Wadden Zee.

WeBS core count winter maxima for the Humber clearly accord with this pattern of variation ranging from 994 in the 1993/94 winter to 2970 in the 1997/98 winter.

During the present project numbers of bar-tailed godwit as recorded by the WeBS core counts were on the low side. Even with the addition of counts from the outer south shore sectors the winter maximum was just 1246 birds in January, the comparative figure excluding the outer south shore sectors being 1130.



By comparison low water counts revealed winter maxima of 3787 in January and 3167 in February in excess of three times the WeBS core count maximum for the entire estuary. This was one of the major findings of the estuary low water project. The highest low water total also exceeds five-year WeBS core count mean winter total for the most recent five winters by an amazing 28% and exceeds the highest core peak in that period by 22%. These finding show that there is either a large undetected high tide roost on the estuary or birds leave the estuary area completely. The latter scenario is most unlikely and it seems necessary to look for a possible location of a high tide roosts site. The most likely location seems to be along the Welwick sector, north J, as the bulk of the birds noted on the two peak winter counts were feeding along that sector and the adjacent Spurn bight, north K, at low water. Unfortunately there were no low water counts carried out in November and December on the Spurn sector.



The remainder of the low water monthly counts produced totals in excess of 1000 birds in September and October but typically low figures from March through to August with a strange nadir of just 34 birds in May. The WeBS core count in the same month revealed the presence of 351 birds, reflecting the spring passage of the species through the estuary. Of this total 256 birds roosted on the Cherry Cobb sector where there was no low water count which presumably explains the loss of these birds from the low water totals.

In species like bar-tailed godwit, where the bulk of the population feed in a limited number of sectors, incomplete coverage even in single months can have a serious reflection on the size of the detected population. It would appear that this species is escaping identification and detection at both low and high water on some sectors.

There are additionally suggestions that birds commute between the north and south shore of the outer estuary between tides. This is a further complication in analysing the fragmented count results.

Bar-tailed Godwits occurred almost exclusively on the outer estuary down river of a line drawn from Paull to Immingham Docks. The only real exception to this pattern being the occurrence of small numbers of birds on the upper estuary mainly around Read's island where 24-36 birds were recorded in September to November and at Whitton sand where a total of 42 were located on a WeBS core count in February.

Due to the absence of a full series of counts on some of the key outer estuary sectors it is not possible to conduct a meaningful analysis of the data for this species. What is evident however, is that an important high tide roost gathered on the Cleethorpes to Buck beck sector in most months, peaking at 680 in October. This same area was also important for feeding birds at low water with a maximum of 450 in September. Birds clearly dispersed from this roost to adjacent sectors with 22-43 birds along the Grimsby Docks sector at low water December to January and July. The Pyewipe sector produced few feeding birds, less than ten, in most months but was important in late winter and spring with respectively, 71, 128 and 59 birds noted in February to April. The latter count formed 84.3% of the estuary total in that month. Further along the southern shore a winter roost at North Cotes held 65 to 238 birds which spread over adjacent sectors at low water.

On the north shore few birds were found on the low water counts on the Cherry Cobb sectors but a high tide roost held 711 in January and 256 in May, the latter month not counted at low water. The adjacent Sunk Island sector produced a maximum of only 75 birds at low water, August and a winter peak of 45 in December. The majority of the winter population were located feeding in the Welwick, north J and Spurn bight, north K, sectors with 92% and 90% of the estuary total in January and February.

Clearly there is still much to be learned of this species on the Humber and accurate recording of the low water feeding areas and high tide roosts on the outer estuary may reveal that the species is of much greater importance on the estuary than is presently recognised. Its reliance upon a small number of feeding and roosting sites makes it particularly vulnerable to pollution incidents within the outer estuary.

Whimbrel *Numenius phaeopus*

Great Britain population too small for meaningful figure to be obtained Passage 50 International 6500

Single monthly counts revealed just how close are the spring and autumn migrations of this species with the former peak in May and the latter in July and August. By September most birds had already moved through the estuary and only nine were found on that month's low water census. The very concentrated nature of the spring passage was shown by the fact that

just one bird was present on the April counts a peak of 48 occurred in May but again just one was noted in June. Of the small May peak the bulk were at just two localities Barton east with 24 and Spurn 14. July is traditionally a good month for movements of flocks of southbound whimbrel along the east coast. The WeBS core count for July, 97 birds was indeed largely composed of two flocks each of 41 at Spurn and Sunk Island. Similarly in August 60 of the total of 87 birds were on the Spurn sector with a further 11 at North Cotes, 7 Pyewipe and the remainder scattered around the estuary. On the low water counts Whimbrel were clearly more widespread in their distribution but mainly occurred on the outer estuary east of the Humber Bridge. Notable concentrations included 16 Barton in May, 12 Sunk Island and 28 Welwick in July and 13 May with 22 July at Spurn.

Curlew *Numenius arquata*

Great Britain 1200 International 3500

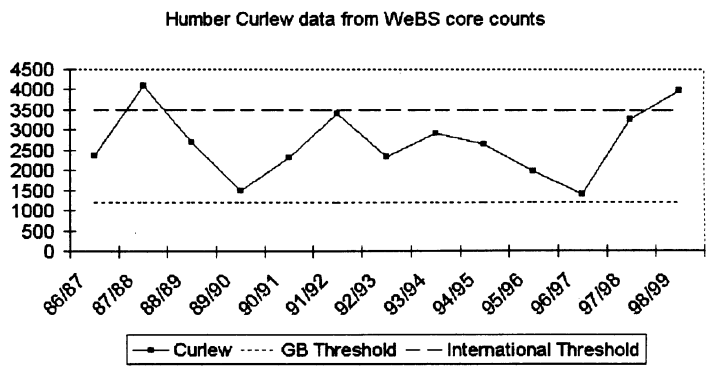
National importance Great Britain threshold 1200 International threshold 3500
Curlew forms a trio of species, with lapwing and golden plover, which regularly feed inland on a variety of sites from wet pastures, to stubbles and even ploughed fields. Inland daytime feeding is most prevalent during the winter period and probably increases in prominence in years with above average rainfall when fields become waterlogged. Birds may flight considerable distances to favoured inland feeding areas, up to five miles from the estuary, and only return to roost sites in the late afternoon, sometimes after dark. Taking into account the varied timing of the different monthly winter counts and these absences of feeding curlew it is not surprising that the results of the mid winter counts show some strange variations in curlew numbers. Within the 1998/1999 counts series the December and January low water totals were affected by inland feeding.

The general pattern of occurrence showed the existence of a clear autumn passage peak between August and October but with a large arrival of birds noted as early as July during 1999. The winter population seemed to be fairly stable from November through to March with the April low water total suggesting an increase in that month as spring migrants swelled the estuary total prior to a major exodus late in the month. Indeed by the time of the May count the reduced summering population of non-breeders, 509 birds was recorded for the first of two consecutive months. A summering population of 480-500 birds is still however, of considerable significance in national terms. There were no instances of potential breeding reported from the immediate environs of the estuary. A few pairs of curlew do still breed on heaths in north-west Lincolnshire, from Risby Warren southwards, and also in the Ancholme valley south of Brigg.

Differences in the low water occurrence patterns between certain sectors and areas of the estuary are shown in the accompanying series of charts. Due to the fragmented series of counts from the outer north shore sectors only odd sectors are illustrated for that major part of the estuary. Of those sectors with an incomplete series of counts some produced very significant counts of curlew. The Cherry Cobb sub-sectors, NG1-NG6, held 810 birds in April, 27% of that month's total, 702 in August 21% of the total and also a mean of 466 during September to November. The Welwick sector, NJ, also had a seasonal peak in April with 366 curlew 12.3% of the total and produced seasonal means of 6.5%, 10.6% and 3.8% of the winter, spring and autumn estuary totals. The Spurn sector, NK, produced an autumn mean of

7.9% with 8.6% in winter and a spring peak of 478 birds in March forming 21% of that month's total.

The peak WeBS core count of the winter period, 3288 in January, was 39% higher than the four month winter mean. With the addition of data from the outer south shore sectors for January the total estuary WeBS winter peak count of 3979 was recorded. This total is 21% higher than the maximum count in the most recent five-winter series and appears to reflect a current upward trend in estuary curlew numbers. If this sort of level of occurrence were maintained then it is feasible that the Humber could attain the level necessary for recognition as being of international importance for curlew.



Comparing the four-month, November to February, and five month November to March, winter period means from WeBS core and low water counts reveals a close similarity in results compared to the wide variation in individual monthly totals (Table 4).

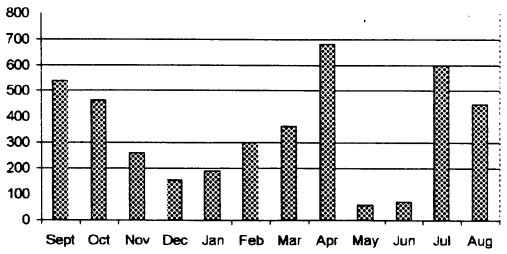
Table 4. A comparison of the four-month, November to February, and five month November to March, winter period means from WeBS core and low water counts for Curlew, 1998-1999

WeBS 4 month mean	2017	WeBS 5 month mean	1930
Low water 4 month	2010	Low water 5 month	2064

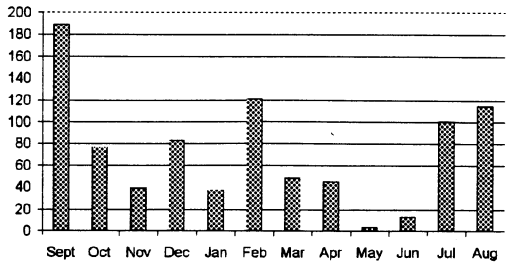
The sectors where the greatest concentrations of feeding birds were recorded also tended to have the largest high tide roosts recorded by the WeBS core counts. In general it appears that curlew prefer to use high tide roost sites close to their favoured low water feeding sites as long as suitable areas are available nearby. On the outer estuary birds often roost on saltmarsh and upper shoreline areas. When such sites are covered by spring tides and at most of the inner estuary localities, curlew take to roosting on adjacent fields, in particular, on any pasture which is available. The most important areas throughout the count series were the Read's Island to Winteringham area, sectors ISC to ISE1, on the inner estuary and Goxhill to East Halton Skitter, ISG and ISH. On the north shore occurrences on the Saltend sector, NF, were more sporadic (see chart), but there were very important concentrations from Cherry Cobb right round to Spurn with the Cherry Cobb and Sunk Island sectors being of particular importance. On the south shore the Pyewipe sector, MSA, proved to be particularly good for the species producing seasonal means of 14%, 7% and 12.7% of the winter, spring and autumn estuary means. By comparison summing the counts from the other outer south shore sectors from Grimsby Docks to Grainthorpe, MSB to MSF, produced monthly maxima of just 141 September and 106 February the only two months in which the totals exceeded 100 birds. Curlew generally fed at low densities with a maximum recorded of 9 birds per hectare and a mean of just 1.29 birds per hectare calculated from individual sector peaks.

Curlew 1998-1999 low tide count data by sector area (note different scales)

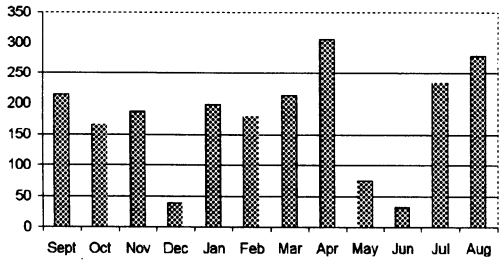
Combined sectors ISC,D,E1



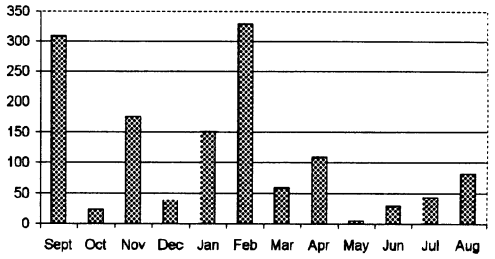
Combined sectors NA,B,C,D,E



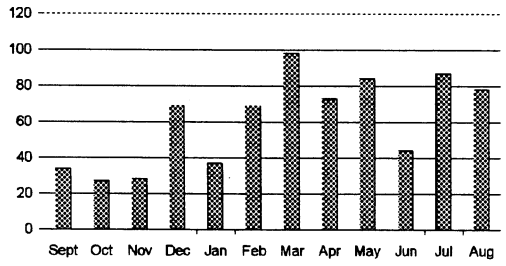
Combined sectors ISG,H



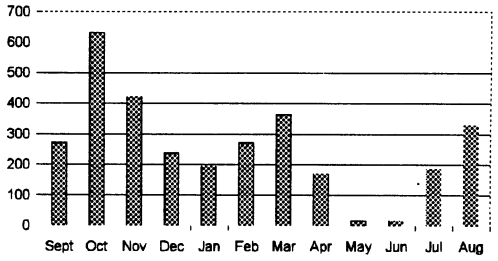
Sector NF



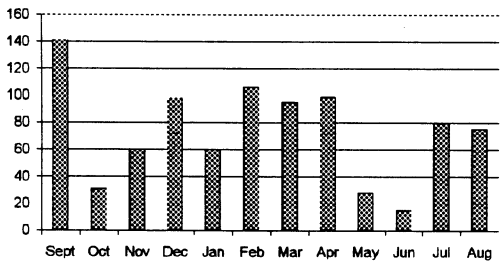
Combined sectors ISI,J1,J2,K



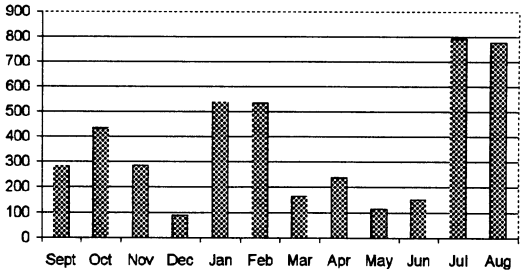
Sector MSA



Combined sectors MSB,C,D,E,F



Sector NH



Spotted Redshank *Tringa erythropus*

Great Britain too small for meaningful figure to be obtained International 1500

With the exception of May spotted redshanks were recorded in every month of the survey period on at least one of the two counts. Maximum numbers occurred in autumn, peaking at 12 in August and 13 in September and October all on WeBS core counts while eight August and nine September were the low water peak totals. The majority of the autumn birds occurred at Blacktoft where the wintering population of four birds were also present. Of note was the presence of four birds in September and five in October on the Sunk island sector with one being found at Spurn in November.

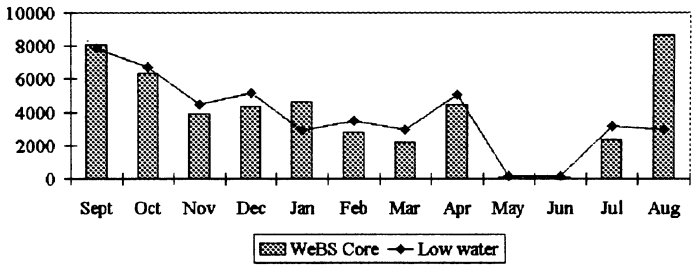
Redshank *Tringa totanus*

Great Britain 1100 Passage 1200 International 1500

Redshank and dunlin were the most widespread waders encountered throughout the estuary at low water. There were considerable differences in the recorded densities of feeding birds across different sectors in addition to which there were obvious differences in the patterns of monthly occurrences between different areas of the estuary which are well shown in the accompanying charts.

The two sets of data, WeBS core and low water, showed a broad correlation throughout the whole series of counts with the obvious exception of the August 1999 figures when a huge count of redshank was noted at Spurn on the WeBS core but the area was not counted at low water. The huge number of birds noted on that month's core count at Spurn swelled the estuary total to the series count peak while the low water figure obviously lacked the same birds.

Redshank WeBS core v low water counts Humber estuary 1998-1999



The general pattern through the year revealed a large autumn passage peak in August/September with an obvious fall in the number of birds present by October and further decline to the wintering population level recorded during November to February and March. A sudden increase in the number of redshank in April reflected the spring passage of what are presumed to be Icelandic breeders. By the time of the May and June counts the total number of birds present represented the local breeding population with about 140 birds noted on both counts. Recorded breeding territories noted in June amounted to about 60-70. It is likely however, that this figure is an underestimate of the true population as there are considerable difficulties involved with finding breeding birds in certain areas of the estuary, notably Read's Island, Tetney and Grainthorpe.

The wintering population appeared to decrease as the winter progressed but some of the variation could have been the result of the incomplete coverage of some key sectors on the outer estuary. Calculating a mean wintering population from the four and five month winter

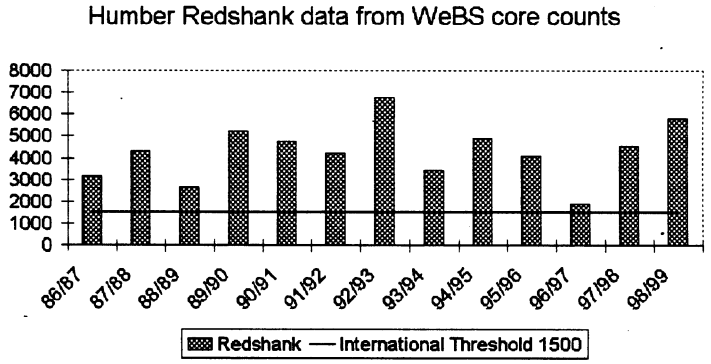
periods, November to February and March, revealed slightly higher totals for low water counts than for WeBS cores (Table 5).

Table 5.A comparison of the four-month, November to February, and five month November to March, winter period means from WeBS core and low water counts for redshank 1998-1999.

WeBS core 4 month	3928	WeBS core 5-month	3581
Low water 4 month	4003	Low water 5-month	3784

A considerable number of redshank were counted on the additional outer south shore sectors, Grainthorpe southwards, during the winter WeBS core counts. The combined winter redshank total for the whole estuary thus became 5812 recorded in December 1998. This is the highest winter total for over five seasons being 19% higher than the 4896 recorded in the 1994/1995 winter and is 36% up on the most recent WeBS core five-year mean. By contrast the WeBS core autumn peak of 8653 in August 1999 was down on the 10,574 recorded in 1997 but note that the figure does not include data from the outer south shore sectors.

The attached sheet demonstrates the occurrence pattern of redshank on some of the key sectors and areas of the estuary, where a full series of counts was available. All areas show the expected low totals of birds noted in May and June reflected in the overall estuary totals. Some sectors were clearly of importance throughout the series, such as sectors ISI-K and Pyewipe, MSA, which held an overall mean of 15% of the estuary population. Others showed a clear autumn peak with reduced winter totals like the Read's Island area, sectors MSC-E1, and Sunk Island, NH. The south shore sectors from Grimsby Docks to Grainthorpe, MSB-E, had an autumn peak but fairly constant winter numbers followed by a spring peak. Sectors ISF-G, Barton to Goxhill held good numbers from late autumn through to March/April a similar pattern to the Saltend sector, NF, just across the estuary. The Grainthorpe sector, MSF, had an exceptional December redshank total but less than half this total through the autumn and remainder of the winter.



Of the sectors lacking a full series of counts the Cherry Cobb sector was of obvious importance recording winter and autumn period means of 985 and 619 respectively. The record of 1090 in November and 1315 in December formed 25% of those months's estuary totals while the 954 recorded in April formed 19% of the spring passage peak. The Spurn bight area was of exceptional importance during the autumn period (Table 6).

Table 6 Numbers of Redshank in the Spurn Sector, NK, as a percentage of the estuary total 1998-1999

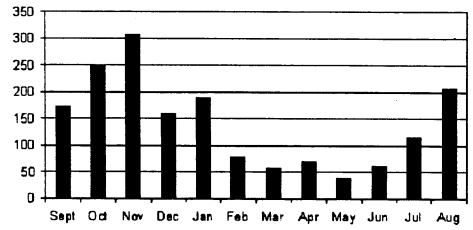
% of estuary total	July	Aug	Sept	Oct
WeBS core	48%	67%	68%	44%
Low water	44%	N/C	45%	42%

Spring passage also produced a low water total, which represented 39% of the estuary total whereas the winter peak formed only 21% of the total in March 1999.

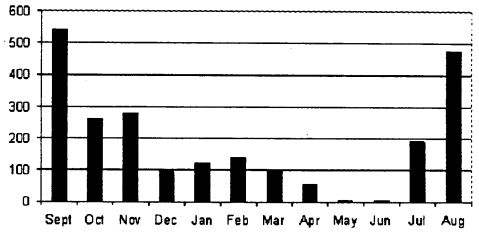
Principal high tide roost sites on the inner estuary were located on Read's Island, at Blacktoft, Whitton Sand and Barton pits where up to 240 birds roosted on mown grassland around the Kimberley Clarke factory site 1km inland. Further around the estuary on the south shore major roosts were found at North Killingholme pits, mainly in autumn, along the sea wall at Immingham Docks, Pyewipe, Cleethorpes, Humberston and right round the North Cotes to Grainthorpe area. On the north bank wets of the bridge some roosted at Saltend but of much greater importance were the Cherry Cobb, Sunk Island and Spurn sectors. Numbers noted on the Welwick sector, NJ, were usually much lower than those recorded on the two sectors either side, Sunk Island and Spurn, with the exception of December 2000 and January 1000 when the Spurn roost appeared to have moved into the Welwick sector.

Redeshank 1998/1999 low tide count data by sector areas (note different scales)

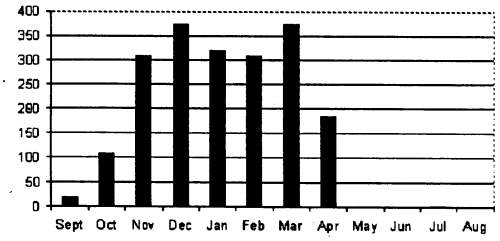
Combined sectors NA2,NB,NC,ND,NE



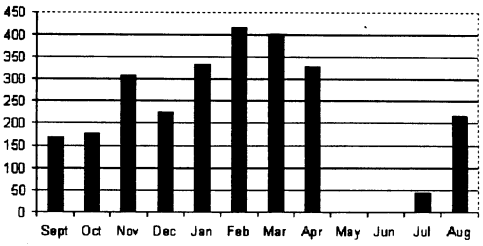
Combined sectors ISC,ISD,ISE1



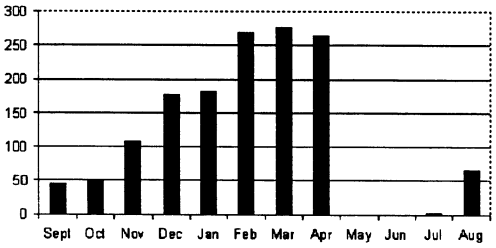
Combined sectors ISF1,F2,F3,G



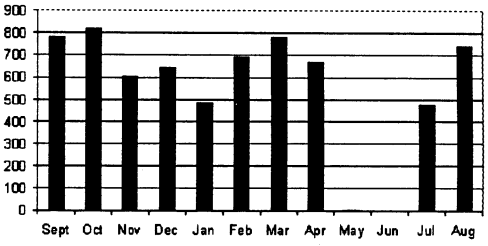
Combined sectors ISI,J1,J2,JJ,K



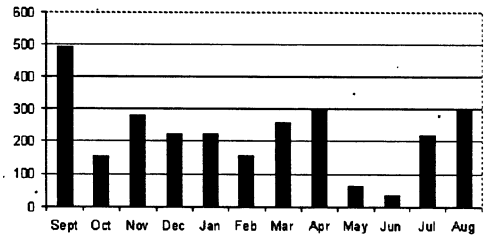
Sector ISK



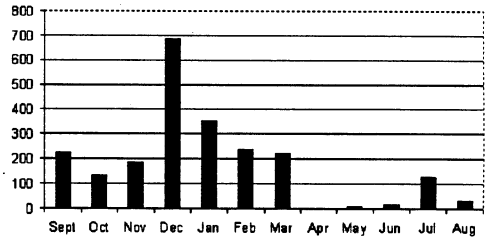
Sector MSA



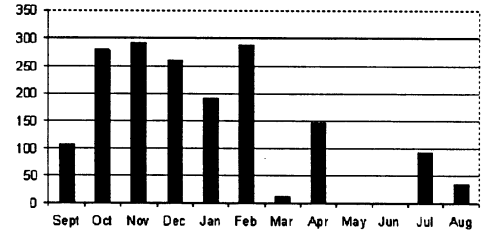
Combined sectors MSB,C,D,E



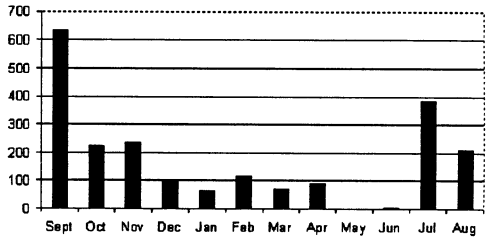
Sector MSF



Sector NF



Sector NH



Greenshank *Tringa nebularia*

Great Britain too small for meaningful figure to be obtained International 3000

Neither of the data sets showed much sign of a spring passage with maxima of just four noted on both May counts. As expected the highest numbers were detected in autumn, July to September following which there were just six in October. As birds are usually more concentrated at high tide the WeBS core counts usually produced larger monthly totals, 48 against 30 on the low water count in September and 88 to 50 in July. This trend was however, reversed in August when the low water peak of 74 birds was recorded and only 42 were noted on the core count of which 22 and ten respectively were at Blacktoft and Spurn. The lagoons at Blacktoft held most of the major concentrations of greenshank throughout with 21 July WeBS core and 20 low water, 23 and 24 August and 18 and 3 September. Other notable gatherings on WeBS core counts were 26 North Cotes and 32 Sunk island July, 12 Read's island and 8 Spurn September. On the low water counts notable were 12 Read's island September, 26 July and 18 August on the Sunk Island sector and 18 Welwick August. One was present on Read's island in November but there were no winter records.

Green Sandpiper *Tringa ochropus*

Great Britain ? International ?

The lagoons at Blacktoft provided the bulk of the green sandpiper records with 24 of the 25 low water birds in July and 18 of 21 in August. These two months were clearly the height of the green sandpiper passage period. Elsewhere of the ten birds noted on the September WeBS core count three were on the Welwick sector and one Sunk Island.

Wood Sandpiper *Tringa glareola*

Single birds were present on the May and June count dates at Blacktoft.

Common Sandpiper *Actitis hypoleucos*

Great Britain ? International ?

Neither the spring nor autumn passage periods produced any really notable number of common sandpipers on the census dates. All spring birds were in May with 13 low water and 14 WeBS core. Seven of the former were on the Spurn sector while of the latter three were at Cleethorpes and four New Holland. Records of one to two birds were widely spread on the autumn counts, which peaked at a disappointing 22 on the August low water census. Notable amongst the low water totals were ten Read's island July and 5 Blacktoft August. Of the WeBS core totals eight Read's Island and six Immingham Docks July with nine Spurn in August were the only sector counts to exceed two birds.

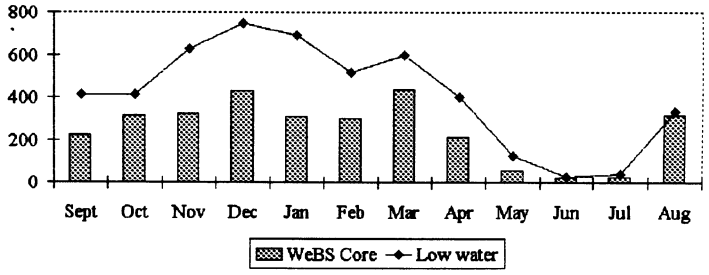
Turnstone *Arenaria interpres*

Great Britain 640 International 700

On the basis of data accumulated from WeBs core counts the Humber has not attained the necessary level for qualification as a nationally important site for turnstone.

During the count series under review the maximum total estuary WeBS core count was 507 recorded in March 1999, well below the Great Britain threshold figure of 640. A feature of the whole series of counts was that the low water totals for certain species regularly exceeded the WeBS core counts for the same months. In the case of Turnstone the WeBS core counts averaged only 60% of the comparative low water figures. The peak low water monthly total of 747 if maintained over a five-season series would in fact suggest that the estuary should be regarded as being of international importance for turnstone. The differences between the two sets of data can mostly be explained by the tendency of the species to roost at high tide in unusual and sometimes inaccessible locations. Considerable numbers of turnstone were found roosting and feeding on Hull docks, with up to 220 birds there in mid winter, and yet this site was never covered on WeBS core counts. It seems likely that a good percentage of these birds may even be additional to the low water totals. Other turnstone were known to have roosted on Grimsby fish docks where access was difficult and up to 50 birds were occasionally noted in Cleethorpes country park, 3km inland from the estuary where WeBS counts were not conducted. Still further birds are known to roost on various lightships in mid estuary, the location of which change with movements of the shipping channel in the upper estuary. The flock that frequents the New Holland area roosts on the pier if undisturbed or on arable fields depending on weather conditions. Birds roosting in fields of growing crops, often mixed in with lapwing and golden plovers, can be very difficult to locate and count. Flocks feeding in relatively restricted inter-tidal areas are much easier to count with accuracy hence the low water counts represent the best estimate of the Humber population.

Turnstone WeBS core v low water counts Humber estuary 1998-1999

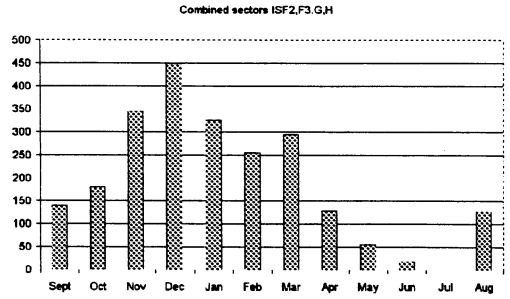


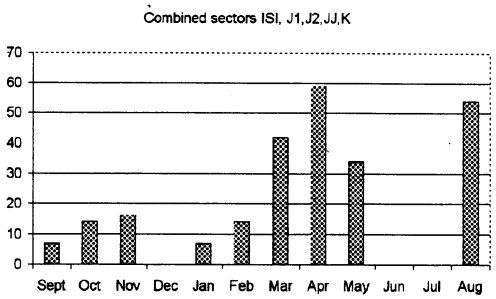
The general pattern of occurrence during the 1998/1999 count series saw a good autumn population level which then, in contrast to many wader species, increased to a higher winter level which was maintained through to March. The April total was equal to the autumn level but fell below the winter peaks. The May figure, 123, was surprisingly low failing to reflect the expected spring passage peak which does however, often occur in the first ten days of May. Typically the mid summer months, June and July only revealed the presence of a remnant total of non-breeding immature birds, 24 June and 40 July.

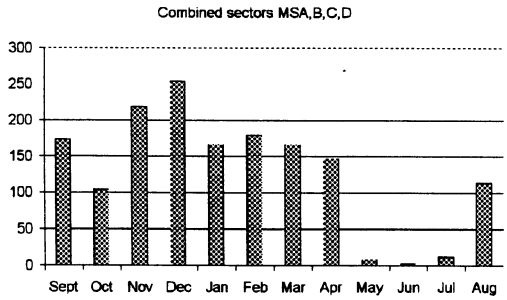
The low water distribution of turnstone around the estuary was restricted due to the preference of the species for feeding on stony, seaweed-covered areas and coarse sandy beaches. Two broad areas held the majority of the Humber population. On the upper estuary the combined sectors from Barton to Goxhill on the south bank and Hessle to Hull west on the

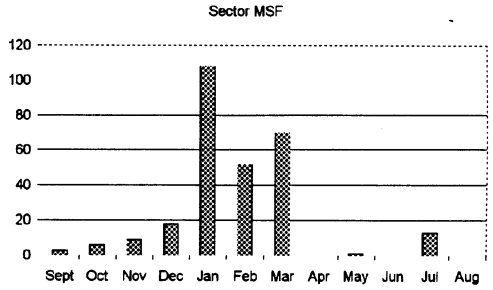
north shore were of major importance..There were regular cross estuary movements of birds between these various sectors depending on the tide height and weather conditions. The second major area for turnstone was the amalgamated sectors from Pyewipe round to North Cotes, MSA-D. Both of these broad areas were of significance throughout the count series. Of the other sectors which produced significant turnstone totals in some months the East Halton to Immingham Docks area, ISI-K, was of importance in spring, March to May, 42, 59, 34 birds and August 54 turnstone. On the outer south shore the Grainthorpe sector, MSF, had good turnstone numbers during January to March, 108, 52 and 70 respectively but otherwise few birds in other months. The only outer north bank sector with decent turnstone totals was Spurn where 78 were noted at low water in October, 41 January and 35 April but more were evident on WeBS core counts with winter, spring and autumn mean counts of 25, 23 and 95 calculated. Differences in occurrence patterns for significant areas of the estuary are shown in the accompanying charts.

Turnstone 1998-1999 low tide count data by sector areas (note different scales)









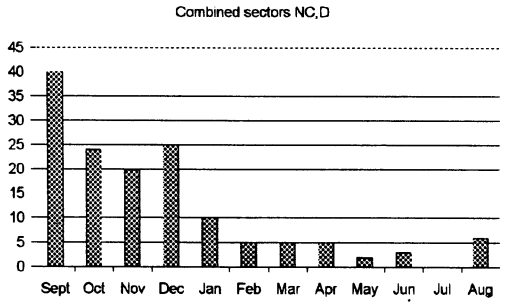


Table 1. Humber estuary low tide count totals September 1998-August 1999

Humber estuary 98-99	Sept L	Oct L	Nov L	Dec L	Jan L	Feb L	Mar L	Apr L	May L	Jun L	July L	Aug L
Red-throated Diver					**5**							
Great Northern Diver												
Little Grebe			1	3	7		6	10	**16**	8	8	5
Great Crested Grebe			1		4		1	3	2	**5**	4	
Slavonian Grebe												
Black-necked Grebe								**1**				
Cormorant	111	100	**153**	51	89	50	59	35	20	31	57	52
Grey Heron	40	26	29	23	12	6	2	14	19	24	**46**	27
Mute Swan	160	214	235	**311**	252	161	146	96	176	140	211	251
Bewick's Swan			**3**		2							
Whooper Swan			10	**16**	13	11	4			2		2
Bean Goose												
Pink-footed Goose	4	**521**	13		385	60			1			
White-fronted Goose		**5**		1	1		1					
Greylag Goose	**762**	483	208	65	364	229	505	178	212	126	261	190
Canada Goose	211	**516**	59	107	271	196	312	213	230	284	347	172
Barnacle Goose								**1**	**1**			
Dark-bellied Brent Goose	5	638	866	**1074**	335	939	298	81	30	13		
Pale-bellied Brent Goose												
Shelduck	**4763**	3683	2350	2129	2121	2454	2396	2058	1416	1653	2235	2805
Eurasian Wigeon	453	2381	**3790**	2441	2842	2412	1818	218	1		2	
Gadwall			11	3	56	10	18	12	23	33	12	**58**
Teal	**2118**	1285	960	1375	727	357	140	117	7	43	183	1229
Mallard	781	1179	1242	**1485**	1469	581	362	192	305	531	438	789
Pintail	**46**	10	2	8	5	18	1	2	1			1
Garganey												**3**
Shoveler	61	94	36	14	13	50	51	32	25	41	23	**203**
Pochard				**235**	114	132	33	27	25	32	58	35
Tufted Duck	1		11	**260**	192	63	85	77	62	25	162	167
Scaup			3	**12**	1							
Eider	**6**	2	1									
Long-tailed Duck							**1**	**1**				
Common Scoter			12	1	**16**							
Velvet Scoter												
Goldeneye			81	**567**	256	101	122	8				
Smew				**6**	3							
Red-breasted Meganser								**2**				
Goosander												
Ruddy Duck	1	1	1		1	2	11	16	**22**	11	9	17
Total wildfowl	**9523**	**11138**	**10078**	**10187**	**9556**	**7831**	**6372**	**3394**	**2594**	**3002**	**4056**	**6006**
Moorhen			1	3	**42**	30	2	5	1	1	2	12
Coot			14	20	28	40	30	**51**	42	6	7	**51**
Oystercatcher	**7725**	2626	1555	1862	1687	1876	2119	1201	766	456	949	2404
Avocet	45	19	3	1		3	49	70	59	49	**143**	115
Little Ringed Plover							1		3	2	**9**	1
Ringed Plover	937	527	459	345	474	504	139	195	**1577**	101	107	1105
Golden Plover	9617	15524	**36231**	25857	15301	4722	2198	549	11	38	3808	12515
Grey Plover	985	872	878	1412	1206	1513	920	**2082**	1593	24	88	1087
Lapwing	2993	3561	7748	**27160**	21695	3778	113	44	61	464	2334	3656

Humber estuary 98-99	Sept L	Oct L	Nov L	Dec L	Jan L	Feb L	Mar L	Apr L	May L	Jun L	July L	Aug L
Knot	8435	9216	7293	25752	20197	**27193**	6656	555	10		45	1064
Sanderling	**278**	139	5	181	62	98	42	24	136	8	9	163
Little Stint	**80**	1	1									1
Curlew Sandpiper	**60**	2								1		1
Dunlin	18005	**19140**	17031	16223	17071	14163	14740	11429	10633	74	18333	5689
Purple Sandpiper				1	**2**	**2**	**2**					
Ruff	88	**104**	30	1				4			29	68
Jack Snipe		3					**4**					
Common Snipe	4	6	14	11	3	16	**94**	50	1	2	12	26
Woodcock												
Black-tailed Godwit	844	740	821	866	828	332	168	140	29		49	**934**
Bar-tailed Godwit	1208	1073	450	349	**3787**	3167	317	70	34	58	219	335
Whimbrel	9								44		42	**59**
Curlew	2868	2707	2139	1431	1897	2576	2279	2966	509	487	2257	**3363**
Spotted Redshank	**9**	6	2	2	4	3	2			2	6	8
Redshank	**7848**	6727	4450	5161	2909	3492	2962	5048	136	140	3149	2978
Greenshank	30	3	1						4		50	**74**
Green Sandpiper	4									1	**25**	21
Wood Sandpiper									**1**	**1**		
Common Sandpiper	9								13		14	**22**
Turnstone	411	415	626	**747**	691	515	596	401	123	24	40	333
Total waders	**62492**	**63411**	**79752**	**107385**	**87884**	**64023**	**33433**	**24884**	**15786**	**1939**	**31726**	**36085**
Total wildfowl & waders	**72015**	**74549**	**89830**	**117572**	**97440**	**71855**	**39805**	**28278**	**18380**	**4941**	**35782**	**42091**

Table 2. Humber estuary WeBS core count totals September 1998-August 1999

Humber estuary 98-99	Sept H	Oct H	Nov H	Dec H	Jan H	Feb H	Mar H	Apr H	May H	June H	July H	Aug H
Red-throated Diver												
Great Northern Diver												
Little Grebe	9	9	18	16	18	23	30	21	21	22	19	21
Great Crested Grebe	1		1		2	9	7	6	8	7	2	5
Slavonian Grebe				2	2	2	2					
Black-necked Grebe								1				
Cormorant	40	57	61	125	71	63	57	32	37	8	30	33
Grey Heron	38	25	20	19	18	6	4	12	18	23	42	46
Mute Swan	155	219	267	314	253	226	165	147	195	132	243	264
Bewick's Swan					2							
Whooper Swan	2	1	14	16	13	7	8			2		2
Bean Goose												
Pink-footed Goose		528	25	16	601			2	1			
White-fronted Goose		5		1			1					
Greylag Goose	39	419	135	76	332	206	226	48	161	38	137	24
Canada Goose	248	538	59	176	182	249	307	191	253	341	393	179
Barnacle Goose					1				1		12	
Dark-bellied Brent Goose		159	437	560	871	636	194	93	133		5	
Pale-bellied Brent Goose												
Shelduck	5186	2972	2030	1877	3047	1952	1918	940	1122	1187	2272	1852
Eurasian Wigeon	457	3001	2209	2735	4210	2465	1569	68	1	2	2	
Gadwall		8	7	15	76	58	30	22	21	42	12	42
Teal	455	1379	638	846	1046	293	152	117	3	56	195	1231
Mallard	736	1085	1444	1124	2100	765	371	306	281	288	512	502
Pintail	10	14	1	1	1	1		3	1			
Garganey												3
Shoveler	51	92	36	20	43	50	57	36	22	12	16	195
Pochard	6		9	323	129	143	57	21	34	35	69	61
Tufted Duck	9	2	25	359	173	81	153	141	60	37	179	202
Scaup			2	12	4		1	1				
Eider	6	2	1	1	10			2		2		1
Long-tailed Duck							1	1				
Common Scoter			4	1								
Velvet Scoter												
Goldeneye			85	579	442	110	140	7				
Smew				7	1							
Red-breasted Meganser			3					3				
Goosander			6	1								
Ruddy Duck	2	1	3		1	27	23	21	17	9	20	26
Total wildfowl	7450	10516	7540	9222	13649	7372	5473	2242	2390	2243	4160	4689
Moorhen	17		105	32	19	28	29	8	7	31	31	49
Coot	51		33	27	136	265	181	100	88	64	74	117
Oystercatcher	3567	2432	2201	1221	1911	1765	909	752	574	569	484	1154
Avocet	45	19				9	49	74	63	60	139	116
Little Ringed Plover								2	2		7	1
Ringed Plover	659	492	260	150	265	225	103	53	894	82	86	1087
Golden Plover	4037	10714	16458	24461	26535	3404	282	235	65		1337	4486
Grey Plover	3025	1149	481	300	1297	233	1433	1500	3443	34	22	836
Lapwing	807	3220	3952	21229	18666	4043	97	48	47	441	1036	2523

Humber estuary 98-99	Sept H	Oct H	Nov H	Dec H	Jan H	Feb H	Mar H	Apr H	May H	June H	July H	Aug H
Knot	7971	29865	10020	9847	25729	5666	1751	70	16	45	39	1874
Sanderling	151	205	71	46	104	209	269	25	178	79	20	581
Little Stint	47	1							1			2
Curlew Sandpiper	90	5							2			5
Dunlin	18538	32310	12644	35128	37471	10778	6322	8440	13162	96	17321	15625
Purple Sandpiper			1									
Ruff	95	176		2	1	21	3	2			29	35
Jack Snipe	1	3					4					
Common Snipe	30	11	19	4	6	18	92	21	2	4	7	31
Woodcock												
Black-tailed Godwit	672	1223	830	793	518	322	120	219	42	3	128	829
Bar-tailed Godwit	508	1447	752	466	1130	937	217	82	331	93	200	208
Whimbrel	5							1	48	1	97	87
Curlew	2466	2876	1312	1391	3288	2080	1583	1624	494	241	1811	1349
Spotted Redshank	13	13	5	2		3	4	2		2	7	12
Redshank	8056	6339	3946	4370	4608	2788	2193	4462	134	84	2348	8653
Greenshank	48	6						2	4		88	42
Green Sandpiper	10									1	22	17
Wood Sandpiper									1	1		
Common Sandpiper	7								14		17	18
Turnstone	225	313	322	431	309	302	436	210	55	22	24	313
Total waders	51141	92861	53412	99901	121993	33096	16077	17932	19667	1953	25359	40050
Total wildfowl & waders	58591	103377	60952	109123	135642	40468	21550	20174	22057	4196	29519	44736

Table 3. Humber estuary WeBS core counts September 1998 to August 1999 including south sectors A-F October-May inclusive

Core incl Outer South	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Red-throated Diver					41		23					
Great Northern Diver												
Little Grebe	9	9	27	25	19	27	30	25	23	22	19	21
Great Crested Grebe	1		1		2	14	7	6	8	7	2	5
Slavonian Grebe				2	2	2	2					
Black-necked Grebe								1				
Cormorant	40	70	91	125	96	132	102	48	39	8	30	33
Grey Heron	38	32	25	27	20	10	6	24	22	23	42	46
Mute Swan	155	219	267	314	253	226	165	147	195	132	243	264
Bewick's Swan					2							
Whooper Swan	2	1	14	16	13	7	8			2		2
Bean Goose												
Pink-footed Goose		552	25	199	601			2				
White-fronted Goose		5		1			1					
Greylag Goose	39	419	135	76	332	206	226	52	161	38	137	24
Canada Goose	248	538	59	176	182	249	307	195	253	341	393	179
Barnacle Goose					1				1		12	
Dark-bellied Brent Goose	1607	1052	2540	2430	909	271	93	157		5		
Pale-bellied Brent Goose												
Shelduck	5186	3488	3061	3458	3999	2485	2062	974	1165	1187	2272	1852
Eurasian Wigeon	457	3477	2531	3047	4439	2559	1578	84		2	2	
Gadwall		8	7	15	76	58	30	22	21	42	12	42
Teal	455	1388	679	907	1236	348	156	117	3	56	195	1231
Mallard	736	1098	1457	1190	2149	830	387	336	289	288	512	502
Pintail	10	21	5	10	27	5		3				
Garganey												3
Shoveler	51	92	37	23	43	51	61	36	22	12	16	195
Pochard	6		9	323	129	143	57	21	34	35	69	61
Tufted Duck	9	10	44	359	173	81	153	141	60	37	179	202
Scaup			2	12	4		1	1				
Eider	6	2	2	1	25			2		2		1
Long-tailed Duck			1		1		1	1				
Common Scoter			83	11	9		2					
Velvet Scoter												
Goldeneye			90	581	442	110	140	7				
Smew				7	1							
Red-breasted Merganser		9					5					
Goosander			6	1								
Ruddy Duck	2	1	3		1	27	23	21	17	9	20	26
Total wildfowl	7450	13037	9732	13446	16748	8961	5799	2382	2473	2243	4160	4689
Moorhen	17	7	105	32	19	28	34	28	14	31	31	49
Coot	51	35	33	27	136	265	185	108	92	64	74	117
Oystercatcher	3567	3188	2906	1965	2638	1882	1361	882	765	569	484	1154
Avocet	45	19				9	49	74	63	60	139	116
Little Ringed Plover								2	2		7	1
Ringed Plover	659	592	265	182	301	264	142	75	1209	82	86	1087
Golden Plover	4037	11947	17109	29348	30535	3912	282	235	69		1337	4486
Grey Plover	3025	1336	640	832	1849	439	1537	1510	3445	34	22	836

Core incl Outer South	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Lapwing	807	3802	4157	29899	19666	4314	97	52	47	441	1036	2523
Knot	7971	29992	12060	11853	27355	7336	2834	70	16	45	39	1874
Sanderling	151	273	203	173	216	223	426	111	312	79	20	581
Little Stint	47	1							1			2
Curlew Sandpiper	90	5							2			5
Dunlin	18538	32777	14344	37038	40112	12378	7537	8470	13408	96	17321	15625
Purple Sandpiper			1					10				
Ruff	95	176		2	1	21	3	2			29	35
Jack Snipe	1	6					6					
Common Snipe	30	22	46	9	6	22	133	33		4	7	31
Woodcock												
Black-tailed Godwit	672	1223	830	793	518	322	122	219	42	3	128	829
Bar-tailed Godwit	508	1709	759	688	1246	1061	231	84	331	93	200	208
Whimbrel	5	1						1	50	1	97	87
Curlew	2466	2957	1469	1613	3979	2275	1742	1678	501	241	1811	1349
Spotted Redshank	13	13	5	2		3	4	2		2	7	12
Redshank	8056	6697	4609	5812	5240	3280	2773	4864	151	84	2348	8653
Greenshank	48	7						4	7		88	42
Green Sandpiper	10									1	22	17
Wood Sandpiper										1		
Common Sandpiper	7								15		17	18
Turnstone	225	321	326	481	423	304	507	210	56	22	24	313
Total waders	51141	97106	60663	120750	134240	38339	20005	18724	20601	1953	25359	40050
Total wildfowl & waders	58591	110143	70395	134196	150988	47300	25804	21106	23074	4196	29519	44739

6. References

CRANSWICK, P.A., POLLITT, M.S., MUSGROVE, A.J. & HUGHES, R.C. 1999 *The Wetland Bird Survey 1997-98: Wildfowl and Wader Counts.* BTO/WWT/RSPB/JNCC, Slimbridge. **5.**

7. Acknowledgements

This project has been a huge co-operative effort undertaken by a dedicated team of volunteer counters. The extent of the achievement in covering such a large estuary should not be underestimated. Many counters who covered both low water and WeBS core surveys were in the field for eight to ten hours in all weathers. The commitment of all concerned to the welfare of the birds of the Humber is undeniable and a tribute to all concerned.
Hopefully all who contributed to the project, and most have been contributing to WeBS core counts for many years, are listed below. To them all I and the co-ordinating team owe our thanks, their efforts will hopefully benefit the birds of the estuary for years to come.

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Appendix 1. Humber estuary sectors and sub sectors as used in the low tide bird counts 1998-1999

Sectors	Sub-sectors	Code	Grid reference	Description
Inner South A		ISA	SE 870 210 to 880 237	Walcot to Alkborough Beacon
Inner South B	Inner South B1	ISB1	SE 880 237 to 899 246	Alkborough beacon to Whitton village
	Inner South B2	ISB2	SE 899 246 to 918 252	Whitton village to Whitton Ness
	Inner South B3	ISB3	SE approx 874 243 to 883 250	south side of Whitton sand counted from south shore but added to sector north B (Whitton Sand)
Inner South C		ISC	SE 918 252 to 946 224	Whitton Ness to 1 km east of Winteringham Haven
Inner South D		ISD	SE 946 224 to 977 213	Winteringham east to South Ferriby bird hide; includes Read's Island and all sand and mudflats to north and west
Inner South E	Inner South E1	ISE1	SE 977 213 to 997 225	South Ferriby bird hide to South Ferriby Cliff and associated mud to the east of Read's Island
	Inner South E2	ISE2	SE 997 225 to TA 010 235	South Ferriby Cliff to Chowder Ness
Inner South F	Inner South F1	ISF1	TA 010 235 to 029 234	Chowder Ness to Barton Haven
	Inner South F2	ISF2	TA 029 234 to 061 238	Barton Haven to Barrow Haven
	Inner South F3	ISF3	TA 061 238 to 080 244	Barrow Haven to New Holland pier
Inner South G		ISG	TA 080 244 to 120 254	New Holland pier to Goxhill Haven
Inner South H		ISH	TA 120 254 to 147 230	Goxhill Haven to East Halton Skitter
Inner South I		ISI	TA 147 230 to 167 201	East Halton Skitter to North Killingholme Haven
Inner South J	Inner South JJ	ISJJ	centre TA 167 198	North Killingholme Haven pits
	Inner South J1	ISJ1	TA 167 201 to 184 178	North Killingholme Haven to LPG jetty
	Inner South J2	ISJ2	TA 184 178 to 188 172	first jetty to South Killingholme Haven
Inner South K		ISK	TA 188 172 to 223 148	South Killingholme Haven to first factory beyond Immingham Dock
Mid South A		MSA	TA 223 148 to 277 114	factory south of Immingham dock to Grimsby Dock tower
Mid South B		MSB	TA 277 114 to 303 097	Grimsby Dock Tower to Cleethorpes wonderland
Mid South C		MSC	TA 303 097 to 340 050	Cleethorpes to Humberston Fitties

Sectors	Sub-sectors	Code	Grid reference	Description
Mid South D		MSD	TA 340 050/347 061 to 351 048/354 055	Humberston Fitties to Tetney Haven
Mid South E	Mid South E1	MSE1	TA 351 048 /354 055 to 370 038/380 047	Tetney Haven to North Cotes Point
	Mid South E2	MSE2	TA 370 038/380 047 to 382 019/400 040	North Cotes Point to Horseshoe Point
Mid South F		MSF	TA 382 019/400 040 to 395 007 along Haven and out to 401 033	Horseshoe Point to Grainthorpe Haven
North A	North A1	NA1	SE 750 265 to SE 816 235	north Whitgift to M62 road bridge
	North A2	NA2	SE 816 235 to SE 860 239	Blacktoft Sands and Howdendyke to Faxfleet
North B	North B1	NB1	SE 860 239 to 875 258	Faxfleet to Weighton Lock including upper Whitton and Faxfleet ponds
	North B2	NB2	SE 875 258 to 905 269	Weighton Lock to Crabley Creek including lower Whitton
	North B3	NB3	SE 905 269 to 935 265	Crabley Creek to Brough
North C		NC	SE 935 265 to 980 250	Brough Haven to North Ferriby
North D		ND	SE 980 250 to TA 024 254	North Ferriby to Humber bridge
North E		NE	TA 024 254 to 100 280	Humber bridge to Hull
North F		NF	TA 100 280 to 168 258	Hull to Paull
North G	North G1	NG1	TA 168 258 to 171 250	Paull to Paull battery
	North G2	NG2	TA 171 250 to 178 247	Paull Battery to Paull Holme
	North G3	NG3	TA 178 247 to 189 236	Paull Holme to Little Humber
	North G4	NG4	TA 189 236 to 194 231	Little Humber to ?
	North G5	NG5	TA 194 231 to 211 213	? to Cherry Cobb
	North G6	NG6	TA 211 213 to 236 189	Cherry Cobb to Stone Creek
North H		NH	TA 147 230 to 335 185	Stone Creek to Patrington Channel
North J		NJ	TA 335 185 to 392 172	Patrington Channel to Sammy's Point
North K		NK	TA 392 172 to 398 106 inclusive	Sammy's Point to Spurn Head includes Spurn Bight

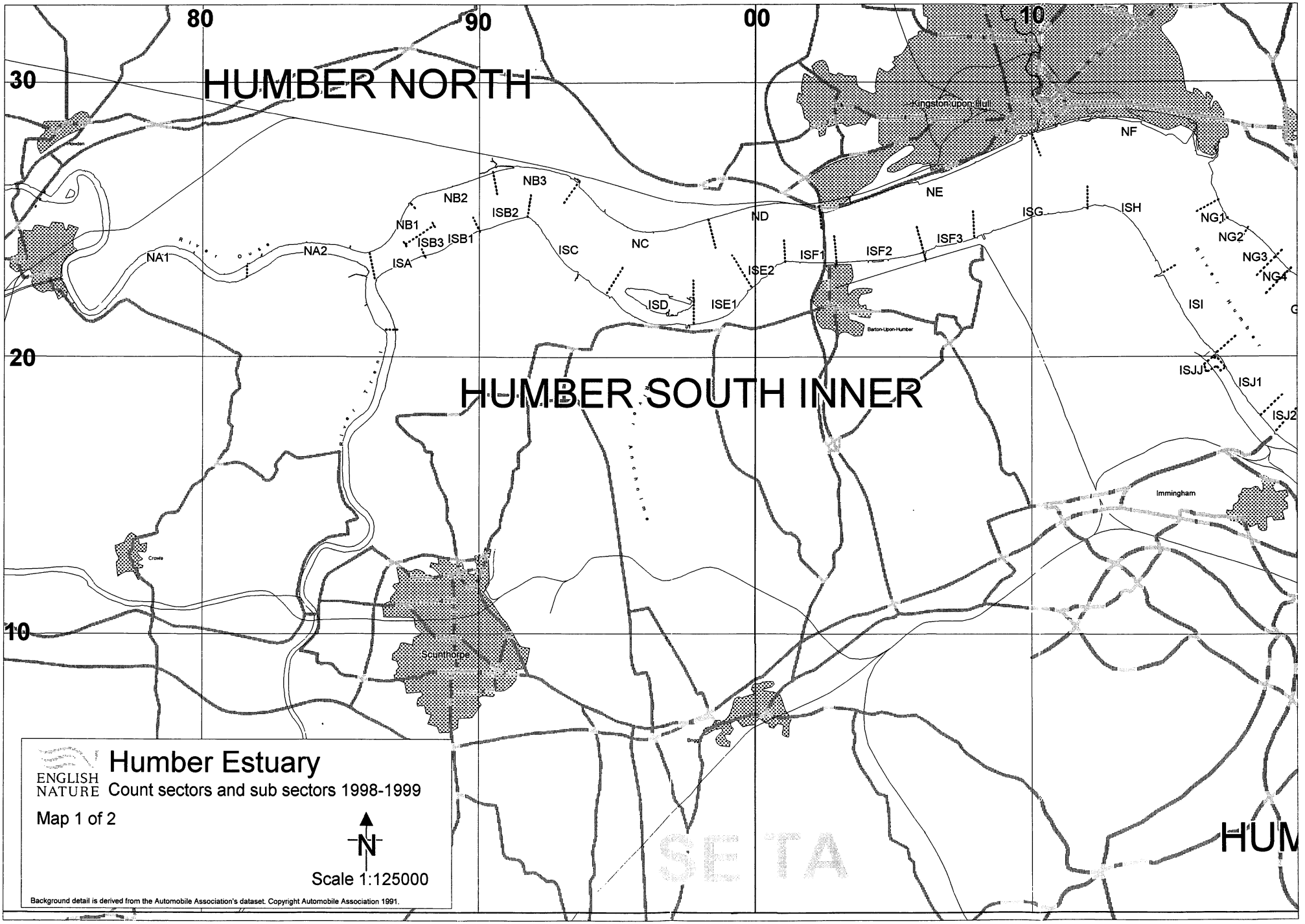
Appendix II. List of abbreviations and sector colloquial names used within this report

Sector names

Barton/Barrow clay pits sectors ISF1, ISF2
Blacktoft sector NA2
Cherry Cobb sector NG sub sectors NG1-NG6
Cleethorpes sector MSC
Grainthorpe sector ISF
Grimsby docks sector MSB
Humberston fitties sector MSD
Immingham docks area sector ISK
North Cotes to Horseshoe Point sector MSE
Pyewipe sector MSA
Read's Island area sectors ISC, ISD ISE1
Saltend sector NF
Sunk Island sector NH
Spurn sector NK
Welwick sector NJ

General abbreviations

Blacktoft	Blacktoft Sands RSPB reserve
bpha	Birds per hectare
BTO	British Trust for Ornithology
EN	English Nature
Low water count	Co-ordinated count of estuary sectors and sub-sectors undertaken within two hours either side of low water on designated Sunday once per month
RSPB	Royal Society for the Protection of Birds
WeBS	Wetland Bird Survey
WeBS core counts	Co-ordinated count of all estuary sectors undertaken within two hours either side of high water one a month generally on a predetermined Sunday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HUMBER NORTH
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Kingston-upon-Hull
Barton-Upon-Humber
Immingham
Scunthorpe
Crowle
NA1
NA2
NB1
NB2
NB3
ISA
ISB1
ISB2
ISB3
ISC
NC
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NF
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ISF3
ISG
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ISI
ISJ1
ISJ2
ISJJ
NG1
NG2
NG3
NG4
River Ouse
River Trent
River Humber
Ancholme
Humber Estuary
ENGLISH NATURE
Count sectors and sub sectors 1998-1999
Map 1 of 2
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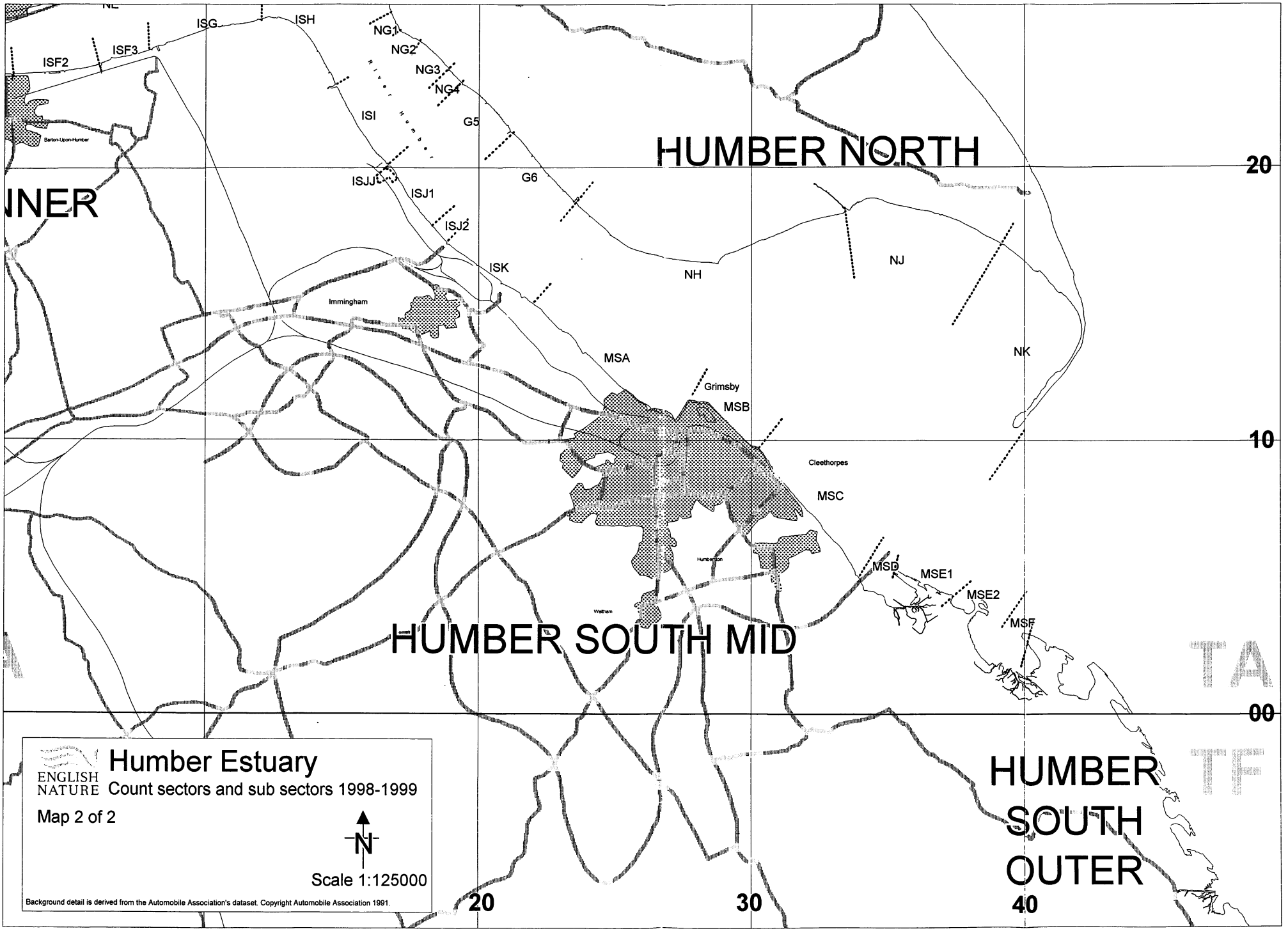
Scale 1:125000
Background detail is derived from the Automobile Association's dataset. Copyright Automobile Association 1991.



Humber Estuary

ENGLISH NATURE

Count sectors and sub sectors 1998-1999

Map 2 of 2

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