

African-Eurasian Flyways

Evidence of decline in the United Kingdom's non-estuarine coastal waders

Stephen Browne, Graham Austin & Mark Rehfisch

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Bird data collected by the Winter Shorebird Count in 1984/85 were compared with data collected by the Non-Estuarine Coastal Waterfowl Survey, Pilot Count in 1994/95. Three of the four most abundant non-estuarine waders, Ringed Plover *Charadrius hiaticula*, Turnstone *Arenaria interpres* and Purple Sandpiper *Calidris maritima*, but not Sanderling *Calidris alba*, showed evidence of significant decreases of 28-53% between the winters of 1984/85 and 1994/95 on 509 paired count sections. As the count sections were not representative of the entire UK coastline, it is not possible to state categorically that UK non-estuarine wader populations have decreased dramatically. However, it is urgent that a full survey of the UK's non-estuarine coast be undertaken.

Stephen Browne, Graham Austin & Mark Rehfisch, British Trust for Ornithology, Wetland & Coastal Ecology Unit, The Nunnery, Thatford, Norfolk IP24 2PU, United Kingdom.

INTRODUCTION

The 1984/85 Winter Shorebird Count (WSC), the most comprehensive survey of the non-estuarine coastline of the UK to date, used approximately 1,500 volunteer counters to survey 10,000 km (approximately 90%) of the non-cliff, non-estuarine coastline of the UK (Moser & Summers 1987). Estimates obtained from WSC data are now over ten years out of date. Given that there have been significant changes in the estuarine populations of these and other species since the WSC (Cayford & Waters 1994), a Non-Estuarine Coastal Waterfowl Survey (NEWS) planned as part of the Wetland Bird Survey (WeBS) for the 1997/98 winter will help with the revision of UK population estimates (see Rose & Stroud 1994). The NEWS will also extend coverage to as much of the European section of the East Atlantic Flyway as possible.

The coverage obtained during the WSC was remarkable and may prove difficult to repeat especially as many European countries may have fewer counters than are available in the UK. Consequently a modification of the WSC methodology has been devised for NEWS and a pilot count undertaken to test the feasibility and reliability of this new methodology during the 1994/95 winter. During the pilot survey, 8.5% of the UK non-estuarine coastline was covered. The data obtained during the pilot survey indicate that significant reductions in the populations of several waders commonly found on non-

estuarine coasts have occurred since 1984/85.

METHODS

Data collection

The methodology used to collect NEWS pilot count data was similar to that used for the WSC, full details of which have appeared elsewhere (Moser & Summers 1987). The NEWS pilot count surveyed 509 count sections which had been covered during the WSC. This represented 10.2% of the sections, corresponding to 9.5% of the coastline, surveyed by the WSC. The NEWS pilot count coverage was representative of the non-coastal habitat in England, north Wales and North-East Scotland (Figure 1). An obvious gap in the geographical coverage was the lack of counts from Shetland, Orkney, the Western Isles, Highland Region and Strathclyde Region (with the exception of Arran and Tiree), and Northern Ireland which received no coverage.

NEWS counts were made of all waterfowl in a section and numbers were recorded separately for birds located on intertidal areas, on the sea and inland, whereas the WSC had only recorded birds of the intertidal area. The WSC had collected information on the primary and secondary habitats, slope and weed cover of each section, NEWS

will collect these environmental data as well as recording details of the weather, shore width and disturbance.

Data comparison

Ringed Plover, Turnstone, Sanderling and Purple Sandpiper are the only species considered here as previous work has shown that the non-estuarine coastline supports a major proportion of the population of these species (Browne *et al.* 1995; Cayford & Waters 1996). Comparisons were made between data obtained for the intertidal area during the NEWS pilot study and that obtained for the corresponding count sections during the WSC. Paired t-tests were used to compare the residuals obtained when the WSC counts were subtracted from the NEWS pilot counts for each section under the null hypothesis that the mean difference between the two surveys was zero. The residuals were normally distributed.



Figure 1. NEWS pilot count sites.

RESULTS

The total and mean numbers of birds recorded on the count sections surveyed by the WSC and NEWS are given in Table 1. Three of the four main non-estuarine species showed significant numerical decreases between the 1984/85 and 1994/95 winters. These decreases ranged from 28% for Ringed Plover ($t_{508}=2.419$, $P=0.016$), to 53% for Purple Sandpiper ($t_{508}=3.299$, $P=0.001$), while Turnstone decreased by 44% ($t_{508}=5.523$, $P<0.0001$). Although Sanderling numbers were found to be lower during the NEWS pilot study than they had been during the WSC, this difference was not significant ($t_{508}=1.097$, $P=0.273$).

Table 1. The total and mean number of birds counted on the 509 non-estuarine sections surveyed during both the 1984/85 and 1994/95 winters as part of the Winter Shorebird Count and Non-Estuarine Coastal Waterfowl Survey pilot count.

	Number of birds (mean number per section)		% difference
	WSC (1984/85)	NEWS (1994/95)	
Ringed Plover <i>Charadrius hiaticula</i>	3181 (6.25)	2298 (4.52)	-28%
Turnstone <i>Arenaria interpres</i>	8034 (15.78)	4478 (8.79)	-44%
Sanderling <i>Calidris alba</i>	3165 (6.22)	2498 (4.90)	-21%
Purple Sandpiper <i>Calidris maritima</i>	2446 (4.81)	1147 (2.25)	-53%

CONCLUSIONS

The 9.5% of the British coastline censused by the two surveys allows valid comparisons to be made of wader numbers between the two periods. These indicate that the populations of Ringed Plover, Turnstone and Purple Sandpiper in the sample sites have decreased significantly between 1984/85 and 1994/95.

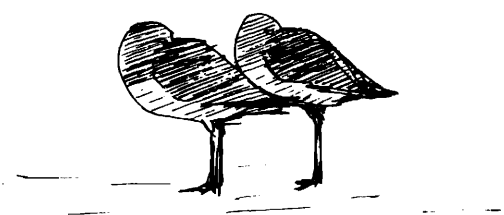
In contrast, Cayford & Waters (1996) indicate that between 1984/85 and 1991/92 the above species may have increased on non-estuarine coasts. The reasons for the observed differences between the two studies is probably due to sampling differences. Cayford & Waters were able to compare data collected from only 40 matched non-estuarine sites covered by WeBS. Also, the geographic range of their sample was not markedly different from that covered by the NEWS Pilot Survey but their sample was limited to sites very close to estuaries, in areas where the birds may have represented an unrepresentative overspill from estuary populations.

There is no evidence of a shift of populations from non-estuarine to estuarine habitat, as the numbers of these species have not changed markedly over the same period from the estuaries covered by WeBS (Cranswick *et al.* 1995). Thus any decrease on the non-estuarine coast is potentially serious.

There was a serious gap in the geographical coverage of the NEWS Pilot study in that Shetland, Orkney, the Western Isles, the Highland Region and most of the Strathclyde Region received no coverage. These areas between them contain 69% of the non-estuarine, non-cliff shoreline of Britain. Furthermore, no coverage was obtained for Northern Ireland. These areas also contain the major part of the populations of each of the three wader species found to have decreased between 1984/85 and 1994/95 on our survey sites. If this decline has been paralleled in other areas of the UK then there may have been a serious decline in the UK wintering populations of these species. Consequently the complete NEWS is

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The Wetland Bird Survey (WeBS): wader counts from the 1993-94 and 1994-95 winters

Ray Waters

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R. Waters, BTO, The Nunnery, Nunnery Place, Thetford, Norfolk IP24 2PU, United Kingdom.

INTRODUCTION

Since 1969, the estuarine bird populations of the UK have been monitored by the British Trust for Ornithology (BTO)'s Birds of Estuaries Enquiry (BoEE), co-funded by the BTO, Joint Nature Conservation Committee (JNCC) and Royal Society for the Protection of Birds (RSPB). In 1993, the BoEE was merged with The Wildfowl & Wetland Trust (WWT)'s National Waterfowl Counts (NWC) to form the Wetland Bird Survey (WeBS). This new scheme monitors both wildfowl and waders at inland and coastal sites throughout the UK. WeBS is run jointly by four organisations (BTO, WWT, RSPB and JNCC) and combines the strengths of the previous count schemes with more efficient data handling, and improved communications between the organisers and the volunteers who carry out the counts. It is hoped that by working together, more resources will be available as well as continuing to provide the information which is crucial to waterfowl conservation in the UK.

A recent development which aids the interpretation and value of the WeBS data is a new analytical method for indexing waterfowl populations. The "Underhill" indexing method models each observation using the product of three factors, a year factor (the "index"), a site factor and a month factor (Underhill & Prys-Jones 1994). This model-based method for imputing missing observations provides a more reliable indicator of population trends than the previous "January index" and can produce indices based on three counts (December-February) from all previous winters (see Prys-Jones *et al.* 1994; Cayford & Waters 1996).

WeBS counts were made by over 3,000 participants on pre-selected dates near the middle of each month. Count dates were chosen to coincide with the best tidal conditions for counting estuarine birds. Detailed results for the winter periods (November-March) for 1993-94 and 1994-95 as well as key findings from passage periods, are available in Cranswick *et al.* (1995) and Waters *et al.* (1996). These, and previous issues, are available from the BTO (address above) price £15 including postage.