

# The Wetland Bird Survey (WeBS): wader counts from the 1991-92 and 1992-93 winters

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This paper introduces the Wetland Bird Survey (WeBS), the new monitoring scheme for waterfowl in the UK. The objectives of the scheme are described together with a resume of current WeBS research. WeBS counts made by more than 3,000 volunteers are presented for the 1991-92 and 1992-93 winters and the results discussed.

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## 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 to develop the scheme in important new areas as well as continuing to provide information which is crucial to bird conservation in the UK.

The objectives of the new scheme are:

- 1 to produce population estimates for wildfowl and waders through the non-breeding period by counting as many of the key waterfowl sites as possible;
- 2 to maintain the programme of annual counting to monitor trends in the numbers and distribution of waterfowl;
- 3 to use the count data to highlight any adverse trends at particular sites which may require more detailed investigation;
- 4 to use count data to provide a sound basis for casework and the protection of important sites against adverse developments; and
- 5 to conduct appropriate research and surveys, additional to the monthly WeBS count, with the aim of filling our gaps in knowledge about distribution,

numbers, habitat use or population dynamics of non-breeding waterfowl.

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 in press). 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.* in press; Cayford & Waters in press).

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 1991-92 and 1992-93 as well as key findings from passage periods, are available in Cranswick *et al.* (1992) and Waters & Cranswick (1993). These, and previous issues, are available from the BTO (address above) price £5.00 including postage. A summary of the results from these two winters is presented below.

## RESULTS

### *1991-92*

For the second year in succession, the complete suite of 117 UK estuaries were counted. In addition to estuaries, 50 non-estuarine and over 1,500 inland wetland sites were also counted in the 1991-92 winter. No periods of prolonged cold weather were recorded. Overall, wader totals were at similarly high levels to 1990-91, with the January count of over 1.72 million birds: a new record for any winter month (Table 1a). It is important to realise that these data are not corrected for coverage and differing

monthly totals do not necessarily reflect absolute or changing population sizes. The excellent coverage was probably partly responsible for the high counts. In at least one month of winter 1991-92, the highest totals on record were noted for Golden Plover *Pluvialis apricaria*, Black-tailed Godwit *Limosa limosa* Sanderling *Calidris alba* and Avocet *Recurvirostra avocetta*. In contrast, national levels of Ringed Plover *Charadrius hiaticula*, Snipe *Gallinago gallinago*, and Purple Sandpiper *Calidris maritima* were well below those of recent winters in most months. Index values (derived from the Underhill model) showing population changes of over 10% (compared to the previous winter) were recorded for Sanderling (21%), Curlew *Numenius arquata* (20%), Black-tailed Godwit (17%) and Bar-tailed Godwit *L. lapponica* (20%). All but the last species showed an increase on the previous year. For species which are scarce, highly mobile, or difficult to census (e.g. Purple Sandpiper, Avocet, Golden Plover and Snipe) indices may be an inaccurate measure of population change. At inland sites Snipe, Green Sandpiper *Tringa ochropus*, Jack Snipe *Lymnocyrtus minimus* and Ruff *Philomachus pugnax* were recorded in numbers comparable to those recorded at estuarine/coastal sites in the 1991-92 winter.

Table 1a. Total number of waders recorded at estuaries and coastal sites in the UK during winter 1991-92.

	NOV	DEC	JAN	FEB	MAR
Oyster-catcher	237134	259287	269928	234674	149195
Avocet	1258	1403	1351	1402	1376
Ringed Plover	9643	10764	9719	8476	4033
Golden Plover	59547	51635	60345	80494	28250
Grey Plover	35123	38301	47726	41803	46411
Lapwing	125256	122963	240787	169154	16750
Knot	279560	285737	275168	216068	120768
Sanderling	7306	5222	6674	7421	6579
Purple Sandpiper	763	1368	1445	1416	1209
Dunlin	436269	524103	580665	458795	192848
Snipe	2114	1926	1705	1488	1037
Black-tailed Godwit	8412	7438	7271	8499	8326
Bar-tailed Godwit	29252	28282	42176	58378	13668
Curlew	55900	59140	84320	90545	60368
Redshank	69777	75000	79515	77094	62469
Turnstone	16289	18278	17764	18446	16432
TOTALS* (all waders)	1374258	1491495	1727195	1474759	730067
No of sites	138	151	158	155	139

Totals are uncorrected for coverage and differing monthly totals and do not necessarily reflect absolute or changing population sizes.

\*Peak counts of species not given above but included in the totals were: Greenshank (323), Ruff (257), Spotted Redshank (80), Jack Snipe (70), Green Sandpiper (32), Common Sandpiper (19), Whimbrel (25), Woodcock (13), Little Stint (4), Curlew Sandpiper (5), Little Ringed Plover (2), Kentish Plover (1), Grey Phalarope (1), Stone Curlew (1), Dotterel (1).

All sites which held on average, more than 20,000 waders in the period 1988-89 to 1992-93 are listed in Table 2,

although other sites will be of international importance also owing to combined totals of waterfowl exceeding 20,000. Most major sites registered overall wader counts which were higher than recent averages. On the Mersey, the very high overall total was caused by above average numbers of Lapwing *Vanellus vanellus* and Dunlin *C. alpina*. On the Blackwater and Dengie, two major estuaries in Essex, high overall totals were due to high counts of Grey Plover *Pluvialis squatarola*, Knot *C. canutus* and Dunlin. In contrast, below average totals were recorded at the Alt and on Lindisfarne where incomplete counts contributed to the low overall totals. At the Alt, particularly low counts of Knot were recorded for the second successive winter.

### 1992-93

Table 1b. Total number of waders recorded at estuaries and coastal sites in the UK during winter 1992-93.

	NOV	DEC	JAN	FEB	MAR
Oyster-catcher	302167	279497	299811	220789	163071
Avocet	1776	1950	1851	2137	1392
Ringed Plover	11017	10311	9185	9610	6302
Golden Plover	74078	110066	65694	93237	58964
Grey Plover	36989	38395	38598	35645	38286
Lapwing	199707	387257	165721	233956	87784
Knot	291639	308760	304701	168840	166830
Sanderling	4366	6173	5093	3791	4731
Purple Sandpiper		1437	1467	1658	1668
Dunlin	357811	457461	423303	372373	310834
Snipe	2908	2084	1278	1491	1311
Black-tailed Godwit	10179	9093	6834	6395	8416
Bar-tailed Godwit	41091	38710	43124	35701	36804
Curlew	66525	89474	67301	77634	63134
Redshank	76519	79188	73134	68725	64673
Turnstone	16537	15321	18118	14486	14431
TOTALS* (All waders)	1495285	1835771	1525810	1347023	1090961
No. of sites	153	160	154	161	146

Totals are uncorrected for coverage and differing monthly totals and do not necessarily reflect absolute or changing population sizes.

\*Peak counts of species not given above but included in the totals were: Greenshank (284), Ruff (161), Spotted Redshank (71), Jack Snipe (48), Green Sandpiper (46), Common Sandpiper (20), Whimbrel (20), Woodcock (5), Little Stint (4), Curlew Sandpiper (1), Little Ringed Plover (1), Kentish Plover (1), Grey Phalarope (1).

Following various recommendations, 12 sites previously classed as non-estuarine were re-classified as estuaries giving a total of 129 estuarine sites. Of these, only the Dart, Looe and Tyne, which together typically support around 500 waders were not counted in the 1992-93 winter. In addition, over 40 non-estuarine sites and over 1,500 inland sites were counted in 1992-93. For the fifth winter in succession, the monthly total for all species combined reached an all time high, with over 1.8 million birds recorded on estuarine or coastal sites in December

1992 (Table 1b). One of the main contributory factors was the British total of over 370,000 Lapwing. Record counts of Golden Plover and Knot also helped push up the overall total.

Table 2. Overall wader counts at principal wetlands in winter.

Site	Peak winter count		Average peak winter count
	1991-92	1992-93	1988-89 to 1992-93
Wash	262285	353017	273844
Morecambe Bay	197182	187384	190955
Ribble	162169	161771	144903
Humber	121991	121989	124584
Dee (Eng/Wales)	119429	158298	115259
Thames	117201	123369	110037
Solway	89380	83773	83875
Severn	54894	51419	59604
Mersey	77106	49519	52593
Medway	53269	54048	50898
Alt	33019	11554	43911
Forth	48744	39236	42496
Langstone Hbr.	42622	37203	40854
Blackwater	35295	77973	40643
Strangford Lough	39794	35160	40149
Swale	39453	45141	36197
Chichester Hbr.	29617	37887	35928
Stour	36028	46633	33912
Burry	21042	22280	29602
Lindisfarne	20374*	30410	27671
Duddon	24976	35052	27292
N Norfolk Marshes	24696	28245	26578
W Sedgemoor§	15571	36710	26138
Dengie	30866	28646	25477
Colne	21960	30100	24538
Inner Moray Firth	22180	28782	23052

§ Inland wetland - counted only in 1991-92 and 1992-93.

\* indicates only incomplete counts were carried out.

The Lapwing total dropped by over 50% between December and January and UK totals were close to those typical of recent years for most of the winter. Black-tailed Godwit and Avocet national totals also reached record-breaking high levels in 1992-93, thus continuing the upward trend of the past decade or so. In contrast, Sanderling, Snipe and, in particular, Turnstone *Arenaria interpres* were recorded in numbers below the average of recent winters. Because Turnstone and Sanderling winter predominantly on open coasts in the UK, significant numbers of birds are not counted by WeBS counts so these may not accurately reflect the national picture. Of more concern are the relatively low numbers of Dunlin recorded in 1992-93.

In 1992-93, the 'Underhill' index changed by more than 10% compared to the previous winter for Sanderling, Dunlin and Turnstone. The Sanderling index dropped by 30% to reach its lowest level for 11 years, whilst the index

dropped by 15% for both Turnstone and Dunlin. The Turnstone winter index in 1992-93 was the lowest for eight years but it is the Dunlin decline which is of most concern. Changes in the index for both Sanderling and Turnstone may merely reflect shifts in population between estuarine sites and nearby, uncounted open coast. The Dunlin index decline, however, suggests a real decline in the UK wintering population.

Table 3. Total number of waders counted at inland wetlands in the UK during winter 1992-93.

	NOV	DEC	JAN	FEB	MAR
Oyster-catcher	244	436	704	4828	6487
Ringed Plover	17	11	5	65	175
Golden Plover	19546	40361	26484	25297	17186
Grey Plover	3	0	0	2	0
Lapwing	72364	156181	134602	102222	20121
Knot	3	0	0	1	0
Sanderling	0	0	1	1	
Dunlin	508	287	620	1250	676
Snipe	3905	3171	2088	3426	2757
Black-tailed Godwit	3	3	121	4	78
Bar-tailed Godwit	14	1	0	29	0
Curllew	3944	3816	4358	6768	4289
Redshank	516	606	630	819	1409
Turnstone	27	7	39	8	0
TOTALS* (all waders)	101228	205073	169957	144991	53569
No. of sites	1,467	1,452	1,546	1,496	1,499

Totals are uncorrected for coverage and differing monthly totals and do not necessarily reflect absolute or changing population sizes.

\*Peak counts of species not given above but included in the totals were: Ruff (259), Green Sandpiper (64), Jack Snipe (46), Common Sandpiper (12), Greenshank (9), Little Ringed Plover (4), Spotted Redshank (2).

During the 1992-93 winter, waders were counted at inland wetlands throughout the UK, in addition to the estuarine and open coastal sites. As at tidal wetlands, numbers of Lapwing and Golden Plover were high in December (Table 3). All sites which average over 20,000 waders are listed in Table 2. At the Blackwater high counts of Lapwing, Golden Plover and Dunlin increased the 'all wader species' total to more than double the average of the previous five years. On the nearby Stour, the overall total was also high, owing to well above average numbers of Lapwing. In north-west England, at the Dee, the overall total Knot was more than 50% higher than the average of the previous five years. In contrast, at the neighbouring Alt, numbers of Dunlin and Knot were particularly low, causing the greatest decline in overall numbers at any major site. The movement of Knot between the Dee and the Alt is well documented and is likely to account for most of these observed fluctuations.

## FUTURE WORK

WeBS offers exciting new opportunities to develop the essential core monitoring programme by conducting research which increases our knowledge of the distribution, numbers and habitat use of waterfowl.

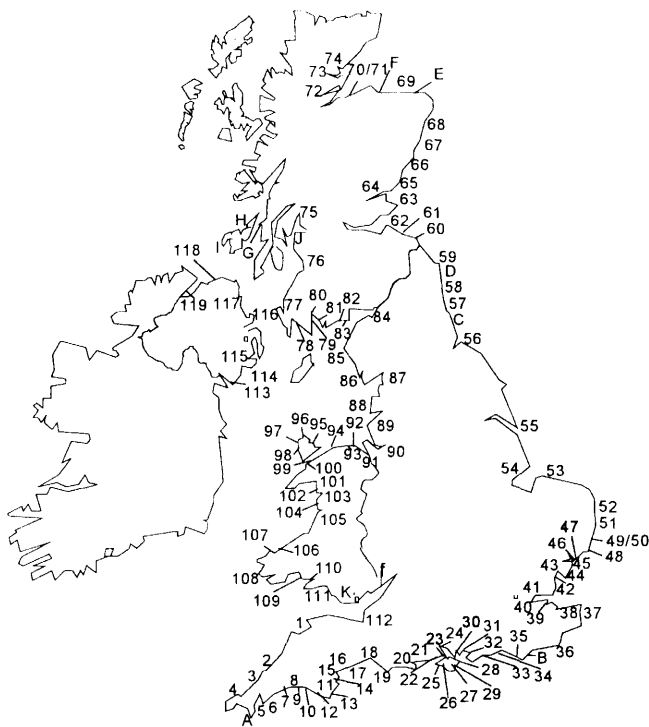


Figure 1. Map of Britain showing the locations of all estuaries considered in this paper. Site code numbers are: 1 Taw/Torridge; 2 Camel; 3 Gannel; 4 Hayle; 5 Fal complex; 6 Fowey; 7 Looe; 8 Tamar complex; 9 Plym; 10 Yealm; 11 Erme; 12 Avon; 13 Kingsbridge; 14 Dart; 15 Teign; 16 Exe; 17 Otter; 18 Axe; 19 The Fleet/Wey; 20 Poole Harbour; 21 Christchurch Harbour; 22 NW Solent; 23 Beaulieu; 24 Southampton Water; 25 Yar; 26 Newtown; 27 Medina; 28 Wootton; 29 Brading Harbour; 30 Portsmouth Harbour; 31 Langstone Harbour; 32 Chichester Harbour; 33 Pagham Harbour; 34 Adur; 35 Newhaven; 36 Rye Harbour/Pett Levels; 37 Pegwell Bay; 38 Swale; 39 Medway; 40 Thames; 41 Crouch/Roach; 42 Dengie; 43 Blackwater; 44 Colne; 45 Hamford Water; 46 Stour; 47 Orwell; 48 Deben; 49/50 Alde complex; 51 Blyth; 52 Breydon Water; 53 N Norfolk Marshes; 54 Wash; 55 Humber; 56 Tees; 57 Blyth; 58 Coquet; 59 Lindisfarne; 60 Tweed; 61 Tynningham; 62 Forth; 63 Eden; 64 Tay; 65 Montrose Basin; 66 Dee; 67 Don; 68 Ythan; 69 Spey; 70/71 Inner Moray Firth; 72 Cromarty Firth; 73 Dornoch Firth; 74 Loch Fleet; 75 Inner Clyde; 76 Irvine; 77 Loch Ryan; 78 Luce Bay; 79 Wigton Bay; 80 Fleet Bay; 81 Kirkcudbright Bay; 82 Auchencairn Bay; 83 Rough Firth; 84 Solway; 85 Irt/Mite/Esk; 86 Duddon; 87 Morecambe Bay; 88 Ribble; 89 Alt; 90 Mersey; 91 Dee; 92 Clwyd; 93 Conwy; 94 Lavan Sands; 95 Red Wharf Bay; 96 Dulas Bay; 97 Inland Sea; 98 Cefni; 99 Braint; 100 Foryd Bay; 101 Traeth Bach; 102 Arfro; 103 Mawddach; 104 Dysynni; 105 Dyfi; 106 Teifi; 107 Nyfer; 108 Cleddau; 109 Carmarthen Bay; 110 Burry; 111 Swansea Bay; 112 Severn; 113 Carlingford Lough; 114 Dundrum Bay; 115 Strangford Lough; 116 Belfast Lough; 117 Lough Larne; 118 Bann; 119 Lough Foyle; A Helford; B Cuckmere; C Tyne; D South Alnmouth; E Banff; F Lossie; G Loch Gilp; H Loch Gruinart (Islay); I Loch Indaal (Islay); J Hunterston; K Afan; L Ogmore.

As part of the WeBS research and survey programme, the BTO has revised population estimates for waders in Britain using data collected during the period 1987-88-1991-92 (Cayford & Waters in press). Amongst other uses, this information will be used to identify sites potentially qualifying for statutory protection on the basis that they regularly support 1% of national populations. In addition, BTO and WWT are collaborating in research which seeks to investigate methods for determining the significance of trends in populations as part of an 'early warning system' at a variety of scales for detecting changes in the number and distribution of waterfowl. In addition, the BTO and WWT are conducting research which looks at the regional variations in the population

trends of individual species using a regionally stratified indexing model similar to that developed by Les Underhill. An important development has been the incorporation of the National Low Tide Count Scheme (established by BTO and RSPB) into WeBS to form the WeBS Low Tide Counts. The aim of this volunteer based scheme is to systematically census each of the 59 main UK estuaries (defined as those with more than 500 wintering waders) on a five year rotational basis. The counts are currently conducted between November and February in order to minimise seasonal variation in counts within estuaries. Estuaries are split into sections, sub-sections and smaller count units termed "mudflats" based on relatively permanent features and the number of feeding and roosting birds recorded together with an estimate of the type and level of disturbance present. Given that non-breeding waterfowl populations are threatened by further reductions in the area of intertidal mud from industrial, agricultural and housing developments on a high proportion of estuaries, data on the low tide distribution of waterfowl is crucial in assessing the importance of intertidal feeding sites for individual wader species. WeBS Low Tide Counts will therefore provide information of value to conservation groups seeking to protect wintering waterfowl through site safeguard and management initiatives.

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