PRINCIPAL SITES

Table 81 lists the principal sites in terms of overall waterfowl numbers in the UK as recorded by WeBS, including all internationally important sites. All sites regularly holding a total of at least 10,000 waterfowl (i.e. divers, grebes, Cormorant, herons, wildfowl, waders and rails) and all sites supporting internationally important numbers of one or more species (see Appendix 1), according to average winter maxima calculated over the five-year period 1989-90 to 1993-94, are included. All estuaries are also included. Sites are ranked according to their average winter maxima over the five-year period 1989-90 to 1993-94. Gull and tern numbers are not included in these totals due to the different coverage these species received (see introduction to the Species Accounts).

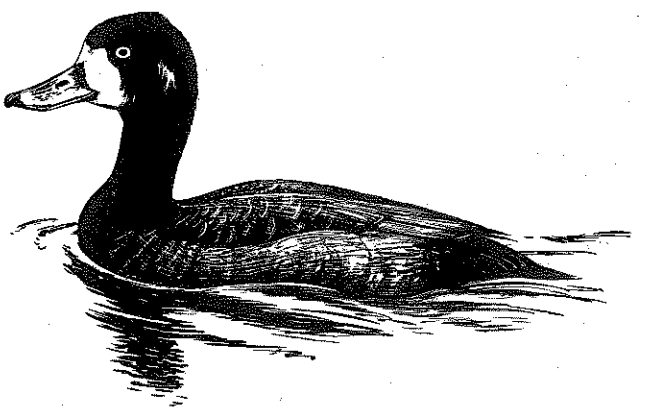
It is important to note that the ranking of sites given in Table 81 relates to waterfowl numbers, rather than conservation importance (see Interpretation of Waterfowl Counts). Also, some sites which may be of critical importance to certain waterfowl species or populations will not be included in this list, for example, sites that are important only in times of severe weather or during migratory periods. The locations of the sites in Table 81 are given in Appendix 2 and Figure 2.

The peak counts at each site are calculated by summing the highest count for each individual species during the winter season, irrespective of the month in which it occurred. The table shows the average peak counts at each site over the period 1989-90 to 1993-94, and the peak counts of all waterfowl, wildfowl and waders in 1993-94 in successive columns. For most inland sites, the numbers of waders present has only been recorded for the past three years. A number of wildfowl species, e.g. rare grebes, have also only been recorded for the past three years. Only WeBS Core Counts and the censuses of Pink-footed and Greylag Geese are included in calculating totals. Additional counts, such as those of sea-ducks on the Moray Firth, made using different methodologies, are not currently incorporated into the WeBS databases. Thus, it should be borne in mind that other sites that are important for certain waterfowl species are not included in the table, whilst the sites listed may be of greater importance for the species listed if additional data were included. The number of Internationally Important Populations (IIP) at each site, and corresponding species codes, are given in the final two columns.

Though the table requires careful interpretation, it does serve to identify many of the UK's important wetlands, and some of the species for which these sites have special value. Readers should refer to the sections on Interpretation of Waterfowl Counts and Data Presentation for further guidance.

Around 80 WeBS sites in the UK now hold, on average, in excess of 10,000 waterfowl. In 1993-94 around half of these sites recorded counts greater than their five year averages. Distinguishing real trends as opposed to inevitable short-term fluctuations requires careful interpretation, especially given the magnitude of some of these fluctuations. Of those sites now averaging over 20,000 waterfowl, five registered counts that were at least 30% above or below these averages in 1993-94; the Dee (Eng/Wal) Estuary (-31%), Loughs Neagh & Beg (-30%), the Tay Estuary (-51%), Poole Harbour (+37%) and Breydon Water (+83%). Golden Plover and Lapwing numbers vary widely at most sites, often in response to weather conditions. At Lough Neagh/Beg, Poole Harbour and especially Breydon Water, one or both of these species were responsible for the unusually high or low counts in 1993-94. This is the fourth winter in succession when Lapwings and Golden Plovers have been present in well above average numbers at Breydon Water. At Lough Neagh/Beg, counts of Coot and Pochard were also particularly low. At the Dee (Eng/Wal) Estuary, another species prone to large annual fluctuations, Knot, was largely responsible for the low total waterfowl count in 1993-94. Oystercatcher, Dunlin, Pintail, Wigeon and Teal were also well down on the five year average for this site. The lower than average count at the Tay Estuary in 1993-94 was due to difficulties in counting the large Eider flock.

Of those sites where the winter peak averages between 10,000 and 20,000 waterfowl over the past five years, only one recorded a 1993-94 peak count that was at least 30% above or below this average. At Outer Ards, the 1993-94 peak was 32% below the five year average for the site, due largely to lower than average counts of Lapwing, Curlew and Turnstone.



Species codes

AV . . . . . Avocet
BA . . . . . Bar-tailed Godwit
BS . . . . . Bewick's Swan
BW . . . . . Black-tailed Godwit
BY . . . . . Barnacle Goose
CA . . . . . Cormorant
CG . . . . . Canada Goose
CO . . . . . Coot
CU . . . . . Curlew
DB . . . . . Dark-bellied Brent Goose
DN . . . . . Dunlin
E . . . . . Eider
EW . . . . . European White-fronted Goose
GA . . . . . Gadwall
GD . . . . . Goosander
GG . . . . . Great Crested Grebe
GJ . . . . . Greylag Goose
GN . . . . . Goldeneye
GP . . . . . Golden Plover
GV . . . . . Grey Plover
KN . . . . . Knot
L . . . . . Lapwing
LG . . . . . Little Grebe
LN . . . . . Long-tailed Duck
LP . . . . . Little Ringed Plover
MA . . . . . Mallard
MS . . . . . Mute Swan
NW . . . . . Greenland White-fronted Goose
OC . . . . . Oystercatcher
PB . . . . . Light-bellied Brent Goose
PG . . . . . Pink-footed Goose
PO . . . . . Pochard
PT . . . . . Pintail
RK . . . . . Redshank
RM . . . . . Red-breasted Merganser
RP . . . . . Ringed Plover
SP . . . . . Scaup
SS . . . . . Sanderling
SU . . . . . Shelduck
SV . . . . . Shoveler
T . . . . . Teal
TT . . . . . Turnstone
TU . . . . . Tufted Duck
WM . . . . . Whimbrel
WN . . . . . Wigeon
WS . . . . . Whooper Swan

Table 81. PRINCIPAL WATERFOWL SITES IN THE UK, 1989-90 TO 1993-94

based on WeBS Core Counts and surveys of Pink-footed and Greylag Geese only

Site name	5 Yr Mean Waterfowl	1993-94 Waterfowl	1993-94 Wildfowl	1993-94 Waders	IIP†	Species codes
Wash	346,282	304,230	100,404	203,826	13	PG,DB,SU,PT,OC,L.,GV,TT,CU, BA,RK,KN,DN
Ribble Est.	250,490	261,404	115,359	146,045	15	BS,WS,SU,WN,T.,PT,OC,L.,GV,BW BA,RK,KN,DN,SS
Morecambe Bay	224,262	201,274	32,999	168,275	12	PG,SU,PT,OC,GV,TT,CU,BA,RK, KN,DN,SS
Thames Est.	144,028	146,610	32,602	114,008	12	DB,SU,OC,RP,GV,TT,BA,RK,KN, DN,SS,AV
Humber Est.	143,016	137,952	21,810	116,142	9	DB,SU,L.,GV,GP,BA,RK,KN,DN
Dee (Eng/Wales) Est.	136,032	94,183	19,585	74,598	11	SU,T.,PT,OC,GV,TT,CU,BW,RK, KN,DN
Solway Est.	127,821	131,690	46,982	84,708	10	WS,PG,BY,PT,SP,OC,CU,BA,KN,DN
Lo. Neagh/Beg	111,518	78,352	72,765	(5,587)	5	BS,WS,PO,TU,GN
Mersey Est.	88,764	81,197	28,961	52,236	6	SU,WN,T.,PT,RK,DN
Forth Est.	83,413	98,945	52,640	46,305	6	PG,SU,TT,BA,RK,KN
Severn Est.	81,669	83,059	21,636	61,423	6	BS,SU,GA,CU,RK,DN
N. Norfolk Marshes	80,211	92,226	67,857	24,369	6	PG,DB,WN,PT,BA,KN
Medway Est.	70,014	61,846	19,118	42,728	7	DB,SU,PT,RP,GV,RK,DN
Blackwater Est.	67,422	82,144	26,151	55,993	6	DB,SU,GV,BW,RK,DN
Somerset Levels	65,280	61,107	29,833	31,274	3	BS,T.,L.
Ouse Washes	61,877	54,381	49,779	4,602	7	BS,WS,WN,GA,PT,SV,BW
Strangford Lo.	58,886	51,888	23,323	28,565	3	PB,RK,KN
Swale Est.	58,425	49,877	25,669	24,208	4	DB,WN,GV,BW,
Chichester Hbr	54,443	55,505	18,361	37,144	5	DB,RP,GV,BA,DN
Montrose Basin	49,791	60,705	49,887	10,818	3	PG,RK,KN
Langstone Hbr	49,757	42,834	11,130	31,704	2	DB,DN
Inner Moray Fth	47,198	49,005	30,007	18,998	6	PG,GJ,WN,RM,BA,RK
Stour Est.	45,350	43,787	10,869	32,918	3	GV,BW,DN
Lindisfarne	43,449	38,327	15,853	22,474	5	GJ,PB,WN,BA,RK
Lo. of Strathbeg	41,606	48,357	47,843	514	3	WS,PG,GJ
Alt Est.	38,995	30,857	2,304	28,553	2	BA,KN,
Dupplin Lo.	38,500	38,500	38,500	-	1	PG
Abberton Rsr	37,250	30,448	26,846	3,602	3	GA,T.,SV
Hamford Water	36,063	44,899	16,619	28,280	5	DB,T.,RP,GV,BW
Colne Est.	35,831	(36,062)	9,166	(26,896)	1	DB
Duddon Est.	35,782	35,600	10,118	25,482	3	PT,RK,KN
Lo. Foyle	35,762	28,871	9,572	19,299	5	BS,WS,PB,WN,BA
Burry Inlet	34,412	31,911	6,082	25,829	2	PT,OC
Lo. Leven	33,408	30,929	30,178	751	2	PG,SV

Lower Derwent Valley	31,190	32,312	26,356	5,956	2	WN,T.
Breydon Water	30,894	56,544	8,445	48,099	1	BS
Dornoch Fth	30,100	30,587	19,866	10,721	3	GJ,WN,BA
Dengie	29,549	26,630	4,290	22,340	3	GV,BA,KN
Cromarty Fth	28,588	31,334	16,437	14,897	5	WS,PG,GJ,WN,BA
West Water Rsr	28,198	40,334	40,334	-	1	PG
Tay Est.	26,657	13,057	2,758	10,299	3	E.,BA,RK
Crouch/Roach Est.	26,600	24,688	8,686	16,002	1	DB
Poole Hbr	25,317	34,663	10,694	23,969	2	SU,BW
Martin Mere	24,851	21,181	19,291	1,890	4	BS,WS,WN,PT
Exe Est.	23,583	22,180	7,004	15,176		
Alde Complex	22,454	20,647	9,162	11,485	2	RK,AV
Inner Clyde	22,398	19,435	7,318	12,117	1	RK
Orwell Est.	22,242	24,942	7,781	17,161		
Rutland Water	21,925	20,253	18,435	1,818	2	GA,SV
Belfast Lo.	20,345	21,806	5,595	16,211	2	TT,RK
Carmarthen Bay	20,039	22,262	7,185	15,077		
Southampton Water	19,670	17,160	8,460	8,700		
Nene Washes	19,609	25,491	19,989	(5,502)	2	BS,PT
Tees Est.	19,605	17,218	6,754	10,464		
Lo. Eye	19,405	17,756	17,756	-	3	WS,PG,GJ
Hule Moss	19,133	15,328	15,324	4	1	PG
Dinnet Lo.	19,042	15,679	15,679	-	1	GJ
Slains Lo.	18,552	24,129	24,129	-	1	PG
Lo. of Skene	18,361	19,178	19,178	-	2	WS,GJ
Fleet/Wey	18,286	19,719	17,469	2,250	1	DB
Outer Ards	17,033	11,560	1,051	10,509	2	RP,TT
Eden Est.	16,348	20,588	6,371	14,217		
Cleddau Est.	16,161	13,522	5,510	8,012		
Deben Est.	15,511	17,983	7,689	10,294		
Pagham Hbr	14,184	14,942	7,440	7,502	1	DB
Carsebreck/Rhynd Lo.	13,960	10,033	8,195	1,838	2	PG,GJ
Lo. of Harray	13,876	10,016	7,471	2,545	2	WS,GJ
Wigtown Bay	13,845	10,883	5,231	5,652	1	PG
NW Solent	13,776	15,644	5,669	9,975	1	DB
Tamar Complex	13,044	13,212	3,049	10,163		
Portsmouth Hbr	12,746	8,962	5,243	3,719	1	DB
Cameron Rsr	12,155	12,342	11,580	762	1	PG
Lavan Sands	11,477	10,251	1,914	8,337		
Ythan Est.	11,061	11,790	3,624	8,166	1	PG
Taw/Torridge Est.	11,003	11,835	3,295	8,540		
Dyfi Est.	10,630	13,761	8,397	5,364		
Chew Valley Lake	10,361	8,935	8,935	-	2	GA,SV
Fala Flow	9,944	6,450	6,450	-	1	PG
Dundrum Bay	9,805	7,062	1,490	5,572	1	PB
Avon Valley (Mid)	9,557	7,998	6,150	(1,848)	2	BS,GA
Irvine Est.	9,055	7,522	2,989	4,533		
South Down	8,809	-	-	-		
Camel Est.	8,804	-	-	-		
Thanet Coast	8,747	11,614	2,195	9,419	1	TT
Castle Lo., Lochmaben	8,741	1,560	1,535	25	1	PG
Blyth (Suffolk) Est.	8,699	9,966	1,926	5,946		
Rye Hbr/Pett Levels	8,547	8,142	2,674	5,408		
Lo. of Kinnordy	8,404	9,931	9,841	90	1	PG
Beaulieu Est.	8,282	9,656	3,378	6,278		
Newtown Est.	7,976	9,056	5,246	3,810		
Upper Lo. Erne	7,712	7,648	5,647	2,001	1	WS
Drummond Pond	7,271	7,707	7,687	20	2	PG,GJ
Pegwell Bay	7,219	12,689	1,457	11,232		
Tyninghame Est.	6,878	5,557	2,261	3,296		
Carlingford Lo.	6,730	8,504	2,771	5,733	1	PB
Lo. Spynie	6,689	6,018	6,018	-	1	GJ
St Benet's Levels	6,317	12,039	1,584	10,455	1	BS
Lo. of Lintrathen	6,215	6,478	6,367	111	1	GJ
Lo. Indaal	6,083	6,401	3,916	2,485		
Haddo House Lo.	5,968	5,810	5,810	-	1	GJ
Inland Sea	5,714	4,847	1,319	3,528		
Hayle Est.	5,192	5,875	1,961	3,914		
Christchurch Hbr	4,891	5,723	1,155	4,568		
Lo. Larne	4,775	2,943	1,751	1,192	1	PB
Lo. Ryan	4,745	4,246	2,012	2,234		
Swansea Bay	4,628	3,784	35	3,749		
Foryd Bay	4,606	6,695	3,052	3,643		
Lo. Tullybelton	4,580	4,100	4,100	-	1	PG
Conwy Est.	4,571	3,723	875	2,848		

Gladhouse Rsr	4,484	3,321	3,270	51	1	PG
Lo. Fleet Complex	4,467	10,058	5,815	4,243		
Cowgill Rsr	4,290	5,100	5,100	-	1	PG
Bann Est.	4,010	4,660	601	4,059		
Traeth Bach	3,957	2,287	1,796	491		
Irt/Mite/Esk Est.	3,874	2,789	1,551	1,238		
Clwyd Est.	3,839	2,768	890	1,878		
Fal Complex	3,791	3,468	143	3,325		
Kingsbridge Est.	3,763	4,026	2,168	1,858		
Auchencairn Bay	3,641	1,755	504	1,251		
Lo. Gruinart	3,370	2,870	1,047	1,823		
Guernsey Coast	3,246	3,332	173	3,159	1	TT
Crombie Lo.	3,224	3,271	3,270	1	1	PG
Adur Est.	3,033	2,712	20	2,692		
Lo. Lomond	3,032	2,145	2,014	131	1	NW
Brading Hbr	2,995	2,639	1,533	1,106		
Holburn Moss	2,983	1,918	1,912	6	1	GJ
Glenfarg Rsr	2,978	2,800	2,800	-	1	PG
Lo. Ken	2,967	2,514	2,271	243	1	NW
Cefni Est.	2,950	2,464	1,695	769		
Lower Bogrotten	2,818	2,080	5,620	-	1	GJ
Hoselaw Lo.	2,668	738	738	-	1	GJ
Red Wharf Bay	2,617	2,594	553	2,041		
Luce Bay	2,554	156	156	-	-	
Lo. Mahaick	2,550	600	600	-	1	PG
Lake of Menteith	2,540	2,440	2,440	(0)	1	PG
Cuckmere Est.	2,285	2,482	1,948	534		
Hightae Loch	2,222	4,544	4,314	230	1	PG
Gadloch	2,215	2,358	2,358	(0)	1	GJ
R. Spey: Boat of Balliefurth	2,215	2,215	1,387	828	1	GJ
Dysynni Est.	2,187	3,052	2,595	457		
Mawddach Est.	2,137	2,635	1,606	1,029		
Braint Est.	2,117	2,818	915	1,903		
Tweed Est.	2,080	2,307	1,555	752		
Corby Lo.	2,032	1,424	1,418	6	1	GJ
Rough Firth	1,981	2,046	404	1,642		
Hunterston Est.	1,973	2,080	1,374	706		
Fedderate Rsr	1,967	-	-	-	1	GJ
Yar Est.	1,963	2,001	1,668	333		
Dee (Sco) Est.	1,663	1,509	940	569		
Ballo Rsr	1,663	327	327	0	1	GJ
Gunton Park Lakes	1,483	1,260	1,256	4	1	GA
Medina Est.	1,474	1,665	440	1,225		
Newhaven Est.	1,437	769	15	754		
Lo. Garten	1,394	1,845	1,845	-	1	GJ
Blyth (N'berland) Est.	1,379	1,031	221	1,080		
Coquet	1,320	1,067	376	691		
Axe Est.	1,275	796	322	474		
Kirkcudbright Bay	1,270	2,234	376	1,858		
Ogmore Est.	1,264	1,092	431	661		
Lossie Est.	1,245	1,250	653	597		
Teifi Est.	1,230	878	713	165		
Otter Est.	1,120	1,442	1,360	82		
Machrihanish	1,096	1,103	1,103	-	1	NW
Rhunahaorine	997	1,050	1,050	-	1	NW
Lo. Gilp	942	783	232	551		
Danna/Keils	894	943	943	-	2	NW,BY
Plym Est.	878	786	94	692		
Deveron Est.	822	952	324	628		
Dulas Bay	821	569	47	522		
Avon Est.	778	240	(49)	191		
Wootton Est.	753	736	305	431		
Yealm Est.	746	903	705	198		
Fleet Bay	740	612	153	459		
Erme Est.	681	627	561	66		
Lo. of Spiggie	636	-	-	-	1	WS
Gannel Est.	624	-	-	-		
Artro Est.	569	382	234	148		
Afan Est.	545	851	181	670		
Don Est.	514	281	189	92		
Black Cart Water	448	448	301	147	1	WS
Nyfer Est.	427	412	107	305		
Teign Est.	396	340	100	240		
Spey Est.	329	-	-	-	-	
South Alnmouth	322	167	34	133		

Tyne Est.	299	-	-	-	-	
Fowey Est.	234	265	143	122		
Helford Est.	208	205	92	113		
Looe Est.	179	244	128	116		
Dart Est.	47	-	-	-	-	
Caithness Lo.	-	-	-	-	1	GJ
Islay	-	-	-	-	2	NW,BY
Walland Marsh	-	-	-	-	1	BS
SW Lancashire	-	-	-	-	1	PG
Coll	-	-	-	-	2	NW,BY
Tiree			-	-	2	NW,BY
Tay/Isla Valley			-		1	GJ
Stranraer Lo.			-		2	NW,BY
Orkney			-		1	GJ
Bute Lochs			-		1	GJ
Colonsay			-		1	BY
Lo. Mullion			2,195		1	PG
Dun's Dish			2,400		1	PG

- *indicates that no total count is available*
() *indicates that no complete count was obtained during 1993-94 and that the count presented here is incomplete*
† *Internationally Important Populations*
NB *Not every species covered by WeBS has a corresponding qualifying level for international importance (see Appendix 1). Hence these species do not feature in this table*

WeBS Low Tide Counts

INTRODUCTION

For over 40 years WeBS has been the main source of information for assessing the importance of UK estuaries to waterfowl at regional, national and international levels. Where WeBS counts are carried out on estuaries, they usually take place at high tide, when the birds are gathered together in communal roosts and relatively easy to count. This means that, whilst being excellent for assessing the overall importance of an estuary for waterfowl, the figures cannot be used to show how the birds distribute themselves when they are feeding. Information that identifies the key feeding areas for different species is becoming more and more important when assessing the likely impacts of various changes to the estuarine environment. Often these changes, such as development or land claim, affect only a proportion of an estuary. In the past, this type of information has often had to be gathered at short notice, usually in response to immediate perceived threats. As a result, there are many estuaries for which there is only anecdotal information on where birds feed.

In 1992, the National Low Tide Count Scheme was initiated, funded by the RSPB and BTO, but run in close co-operation with WWT and JNCC. Its aim was to provide the systematically-collected information on low tide distribution of waterfowl so far lacking. The success of the scheme during its first year led to its incorporation into WeBS, thus becoming the WeBS Low Tide Counts. A new recording form was introduced in November 1994 as part of this integration process. This allows standardisation of data collected from all sites and is very similar to the WeBS Core Counts form, meaning that all additional information such as weather is also standardised between the Core Counts and the Low Tide Counts. This year, for the first time, the WeBS Annual Report contains data collected by the Low Tide Counts. All future reports will contain the latest results and it is anticipated that, in time, more detailed analyses will be possible, with summary results reported here also.

This is a major step forward in estuary conservation, one that would not have been possible without the enthusiasm and dedication of the volunteers who take part. The Core Counts continue to provide us with definitive and widely respected population estimates for sites, but the Low Tide Counts now complement these by recording waterfowl distribution. They show the relative importance of different areas for feeding waterfowl in the winter period, areas which are often very different to those which are important for roosting. Together, the two schemes put us in a better position than ever to safeguard our estuaries for the future.

METHODS

Counting very large estuaries at low tide requires a specialised approach, so initially only the 59 'medium-sized' estuaries, i.e. those that held between 5,000 and 15,000 waders, were targeted. Low Tide Counts are more labour-intensive than Core Counts and so, to avoid overloading counters, a programme of coverage was adopted in which about a dozen estuaries would be counted once every five years on a rotational basis.

Each estuary is divided into a number of sections. The boundaries of each section are chosen to coincide with the sector boundaries used in the Core Counts so that comparisons between low and high water counts can be made. However, the majority of these sectors are too large for one person to count at low tide and it is necessary to divide them up. Each subdivision can then be counted by a single volunteer. To maximise count accuracy, each counter is provided with instructions on how to further subdivide their section into a number of smaller count areas ('mudflats'). Sections are usually divided into between one and ten mudflats, depending on the intertidal area, using permanent features which can be identified at a later stage for repeat counts. Each counter is provided with two copies of a map of the area on which they mark the mudflat boundaries and, if necessary, the features used to recognise them. One copy is returned to the BTO and the other retained by the counter.

It was decided that the counts should focus on the winter period, when bird numbers fluctuate least, and that they should take place frequently enough to provide the right amount of information for conservation purposes without overloading the counters. Consequently, they take place once a month from November to February inclusive, usually on a different day to the Core Counts both to avoid confusion between the two sets of counts and because high tide and low tide do not often occur in daylight on the same day during the short winter days. Wherever possible, all Low Tide Counts on a particular estuary are carried out on the same day but on a small number of occasions this is not possible. In these situations, counters are asked to count on a date as near as possible to the one originally decided. All counts take place within two hours of low tide, the period of the tidal cycle when bird distribution is likely to vary least.

DATA INTERPRETATION AND PRESENTATION

Data for all eight estuaries taking part in the Low Tide Counts during the 1993-94 winter are included here, covering the period November to February inclusive. Distributions are presented using densities, rather than numbers, because of the methodological differences between the Low Tide Counts and the Core Counts and to allow comparisons between mudflats of different sizes. The Core Counts provide accurate counts of whole estuary populations and should generally be used in any assessment of the national and international importance of a site. Low Tide Counts, on the other hand, provide a 'snapshot' of feeding distribution at low tide during the winter and are designed to give an indication of the relative importance of each mudflat to each species present within individual estuaries in the winter period. As with the Core Counts, the results are presented here in summary form, the primary aim being to provide feedback to WeBS counters and others. It is particularly important to remember that the use made of different mudflats may vary markedly in seasons not covered by the Low Tide Counts. Thus, results presented here are not absolute statements of relative conservation importance, rather they are the first steps to understanding how waterfowl use estuaries and the 'preliminary' nature of the data in this regard should be recognised. More detailed information on how to make use of the data for research and site assessment purposes can be obtained from BTO headquarters.

Table 82 shows the mean and maximum density for occupied mudflats and the percentage of the total intertidal area occupied for the 19 most numerous species present on estuaries covered during the 1993-94 winter. Overall mean densities for the site were calculated by summing the mean number of birds present on each occupied mudflat and dividing the sum by the total area of occupied mudflats. The values given for maximum density are the maximum densities recorded for each species on any individual mudflat. Mean density values for individual mudflats used to plot the distribution maps were calculated by dividing the mean number of birds present on each occupied mudflat by the area of each mudflat.

ESTUARY ACCOUNTS

The following accounts describe the results of the Low Tide Counts carried out during the 1993-94 winter, which took place on eight estuaries: Chichester Harbour (240), Duddon (101), Inner Thames (176), Kingsbridge (220), Langstone Harbour (239), Poole Harbour (227), Strangford Lough (95) and Tay (30) (numbers correspond to the key for Figure 2 showing the location of sites, page 20). Individual species accounts are not given both because results are available from relatively few estuaries and so as to highlight the difference in the aims of this scheme compared with the Core Counts. In each case, a list of nationally and internationally important species present, based on Core Counts, and a description of the estuary are given. This is followed by an outline of the key results. In addition to a master map of the count areas, distribution maps are given for each internationally important species present showing the mean density recorded on each. Where there are more than three internationally important species, maps for the two most abundant species are shown. Where no internationally important species are present, for example, two examples of nationally important species are used or, if no nationally important species are present, the two most numerous species are used.

SPECIES	Chichester Hbr			Duddon			Inner Thames			Kingsbridge			Langstone			Poole Harbour			Strangford Lough			Tay		
	mean density	max density	% area occ.	mean density	max density	% area occ.	mean density	max density	% area occ.	mean density	max density	% area occ.	mean density	max density	% area occ.	mean density	max density	% area occ.	mean density	max density	% area occ.	mean density	max density	% area occ.
Brent Goose	2.8	13.5	87.7	0	0	0	32.3	666.5	12.0	0.5	0.9	30.0	4.7	508.4	96.5	1.3	7.4	62.7	0.4	5.6	92.2	+	0	0.9
Shelduck	0.6	4.0	85.6	0.2	7.3	67.7	0.7	3.4	87.5	0.5	1.3	86.2	0.6	14.2	83.0	1.6	4.2	92.7	0.3	5.8	82.9	+	0.1	55.2
Wigeon	0.7	10.2	28.8	0.3	0.7	23.3	0.8	1.6	20.6	3.4	30.6	67.4	1.6	48.0	25.0	0.8	3.6	71.8	0.3	6.0	40.0	0.1	1.3	27.1
Teal	0.4	14.5	46.3	+	0.1	9.2	2.2	13.4	70.5	0.8	4.1	33.5	0.6	28.4	25.2	0.7	3.3	63.9	0.3	1.9	28.9	+	0	12.6
Mallard	0.1	1.0	46.1	0.2	1.7	49.1	1.0	24.0	98.3	0.7	6.5	80.8	0.2	5.6	21.5	0.1	0.8	84.5	0.1	1.6	32.0	0.3	47.5	67.9
Pintail	0.2	2.4	7.2	0.9	5.1	16.2	0	0	0	0.1	0.2	18.7	0.4	9.0	22.7	0.2	0.7	33.6	0.1	1.1	20.7	0	0	0
Oystercatcher	0.4	2.6	79.7	0.8	11.3	71.4	+	0.1	16.2	0.5	1.7	95.6	1.4	13.4	94.5	1.0	7.1	98.2	0.9	27.2	95.3	0.8	114.0	58.9
Ringed Plover	0.1	1.0	58.8	0.2	0.6	22.6	0.4	2.3	50.1	0.1	0.1	10.3	0.1	0.6	62.9	0.2	1.0	20.3	0.1	1.0	42.6	0.1	1.1	10.4
Golden Plover	1.0	7.6	10.9	0.1	0.1	3.6	+	0	8.8	0	0	0	+	0	2.6	0.1	0.1	1.8	1.2	4.0	38.7	0.6	6.0	18.1
Grey Plover	0.3	2.6	88.6	0.2	0.9	42.8	0.1	0.3	31.0	0.1	0.5	35.8	0.6	4.1	96.2	0.5	8.5	57.0	0.1	0.8	34.1	0.4	3.0	13.9
Lapwing	1.0	15.0	54.9	0.4	2.1	37.1	4.9	19.7	92.9	0	0	0	1.4	75.6	35.3	2.6	34.3	61.2	0.5	4.5	72.5	0.6	5.5	54.5
Knot	0.4	1.6	30.2	2.1	7.8	14.3	0	0	0	0	0	0	1.0	10.9	69.0	0.1	1.1	10.0	1.8	19.8	48.9	0.3	8.7	2.8
Sanderling	0.4	0.6	8.7	0.1	0.3	21.5	0	0	0	0	0	0	0.2	0.5	14.3	+	0.1	1.5	+	0.0	1.5	0.1	0.7	11.0
Dunlin	5.8	34.9	86.5	3.9	93.0	45.0	10.4	35.8	85.3	2.4	18.0	70.5	10.1	31.6	96.2	3.5	15.6	86.7	1.4	13.1	79.6	1.3	8.3	56.9
Black-tailed Godwit	0.2	4.0	52.3	0	0	0	0	0	0	0.1	0.1	4.4	0.2	1.2	64.1	1.2	15.1	70.0	+	0.5	17.0	0	0	0
Bar-tailed Godwit	0.3	3.2	45.8	+	0.1	13.6	0	0	0	0.1	0.1	4.4	0.5	3.8	71.3	0.3	0.9	10.9	0.3	3.5	25.5	0.7	15.3	25.2
Curlew	0.2	1.2	87.1	0.3	1.4	68.7	0.1	0.1	4.7	0.7	2.7	100.0	0.5	10.0	96.5	1.2	4.5	97.9	0.2	0.9	96.0	0.1	2.7	83.8
Redshank	0.3	2.3	88.6	0.4	5.3	72.2	2.8	24.3	100.0	0.6	1.7	97.2	0.3	1.9	86.7	0.8	5.8	96.1	0.2	3.4	92.8	0.3	5.0	67.4
Turnstone	+	0.3	33.1	+	0.1	19.7	0.1	0.1	13.0	0.2	0.6	9.1	0.2	1.0	84.2	0.2	0.6	3.6	0.1	0.4	40.5	0.1	0.5	12.3

Table 82. Mean and maximum density (birds ha^{-1}) on occupied mudflats and % area occupied for each of the 19 most numerous species present on the estuaries covered during the 1993-94 winter. '+' indicates densities of less than 0.1 birds ha^{-1}.

CHICHESTER HARBOUR
Sussex

Internationally important species: Dark-bellied Brent Goose, Ringed Plover, Grey Plover, Dunlin, Bar-tailed Godwit

Nationally important species: Little Grebe, Shelduck, Red-breasted Merganser, Sanderling, Black-tailed Godwit, Redshank

Site description

Chichester Harbour is large and complex in shape (Figure 3). Four major arms formed by land sinking along four small river valleys run into a wider area near the mouth of the estuary and there is a fairly wide opening to the sea (Prater 1981). The river channels are muddy whereas the intertidal areas south of Thorney Island are much sandier. The estuary is extremely popular with watersports enthusiasts so, although the majority of the shoreline is undeveloped with restricted access, those areas with public access are heavily used.

Bird distribution

The main concentration of Brent Geese occurred in the western half of the harbour between Thorney Island and Hayling Island, where they fed on fields later in the winter. The highest winter densities were recorded on the mudflats in the Emsworth Channel adjacent to the northern end of the island (Figure 3). Shelduck were also commonest in this half of the harbour, with highest numbers present south of Marker Point. The highest densities, however, were found in the smaller sheltered bays elsewhere in the harbour. Sheltered corners and creek-ends, for example at Dell Quay and Bosham, tended to support the highest number of Wigeon, Teal and what few Pintail there were. A preference for saltmarsh habitat and an avoidance of more disturbed areas may both be factors affecting their distribution. Mallard were either associated with the other duck species or recorded near human habitation.

The total number of Oystercatchers recorded within the harbour as part of the Low Tide Counts remained fairly stable throughout the winter. One count area in particular, between Marker Point and Longmere Point, held high numbers of Oystercatcher in densities of more than 2.5 birds ha^{-1}. Knot showed a similar preference for this area which is much sandier than the areas upstream. Solitary feeders such as Ringed Plover (Figure 3), Grey Plover (Figure 3), Curlew and Redshank were present in relatively low densities (<1 ha^{-1}) throughout most of the estuary. By far the highest densities of Grey Plover were recorded in the sandy mouth of the estuary (Figure 3), whereas the highest densities of Curlew and Redshank were in the eastern half. Both Lapwing and Golden Plover showed a pattern of fluctuation in numbers between months typical of the species. Very low numbers were recorded in November whereas in January there had clearly been an influx. Grey Plover numbers also increased in January, suggesting a general pattern of wader movement into the estuary, possibly as a result of cold weather east of the UK. Sanderling were recorded on only two count areas, both of which were sandy areas near the mouth of the estuary and one near Bosham. Dunlin were recorded throughout the estuary, but the majority occurred at the end of Southbourne Creek. The highest densities occurred near Itchenor (>10 birds ha^{-1}) and near the mouth of the estuary off South Hayling (>30 birds ha^{-1}). The contrast between Bar-tailed Godwit and Black-tailed Godwit distribution highlighted in previous low tide counts on other estuaries was also observed within Chichester Harbour. The highest numbers of Black-tailed Godwit were observed in the muddy sheltered bays and creek-ends, whereas Bar-tailed Godwit clearly preferred the sandier count areas near the mouth of the estuary, a preference previously noted by Tubbs (1977). Black-tailed Godwit occurred in particularly high densities near the sewage outfall at Dell Quay, whereas Bar-tailed Godwit occurred in particularly high densities on a count area near the mouth of the estuary.

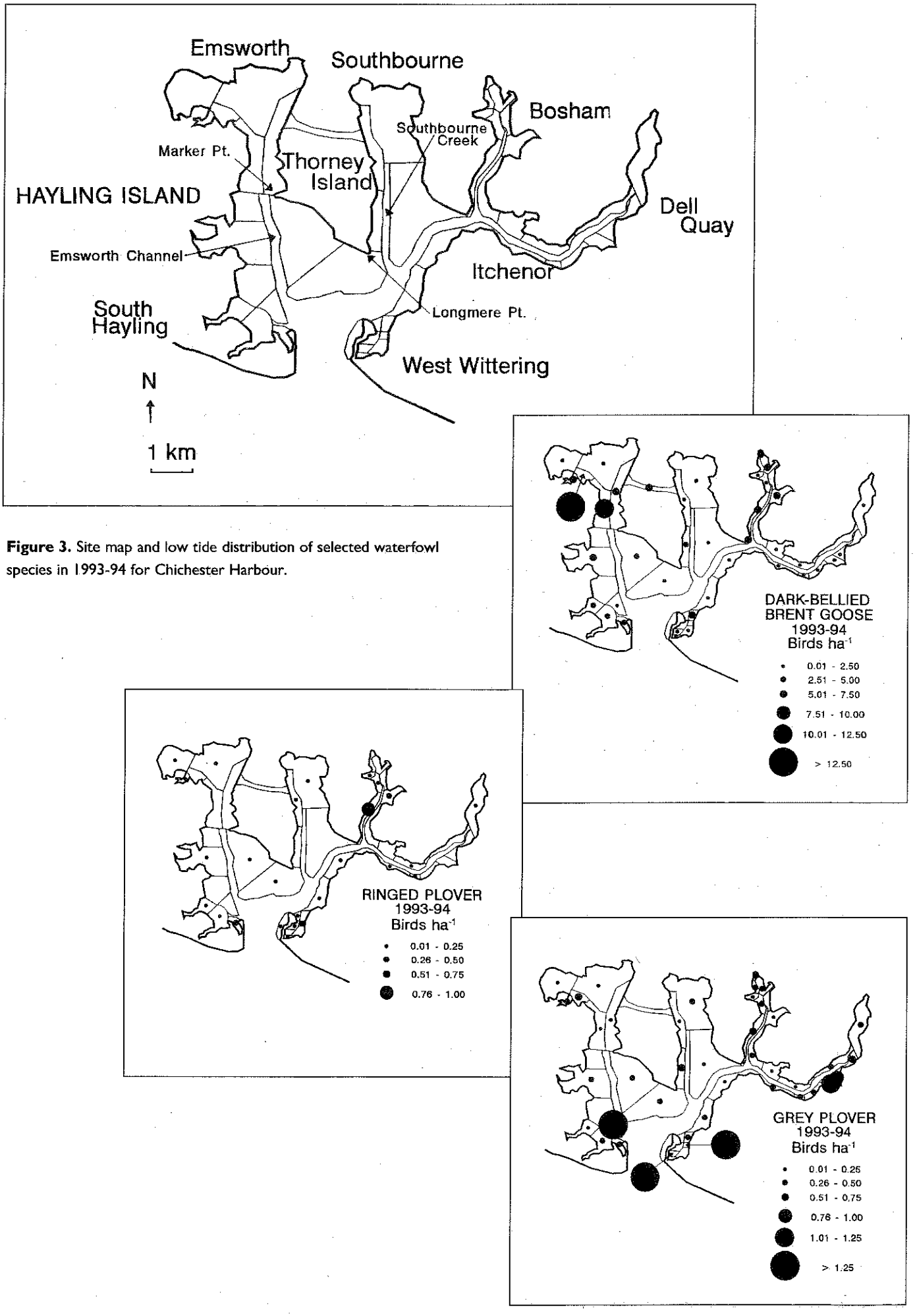


Figure 3. Site map and low tide distribution of selected waterfowl species in 1993-94 for Chichester Harbour.

DUDDON ESTUARY
Cumbria

Internationally important species: Pintail, Knot

Nationally important species: Shelduck, Red-breasted Merganser, Oystercatcher, Ringed Plover, Grey Plover, Sanderling, Dunlin, Curlew, Redshank

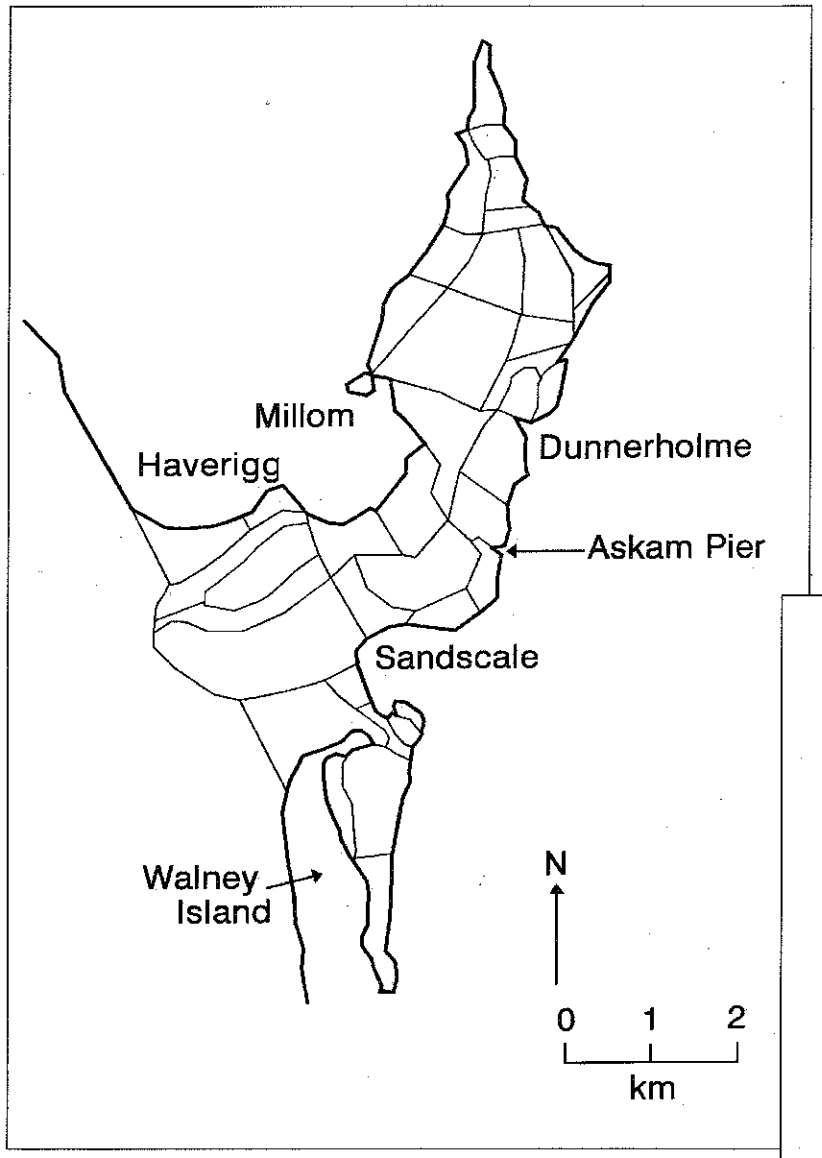
Site description

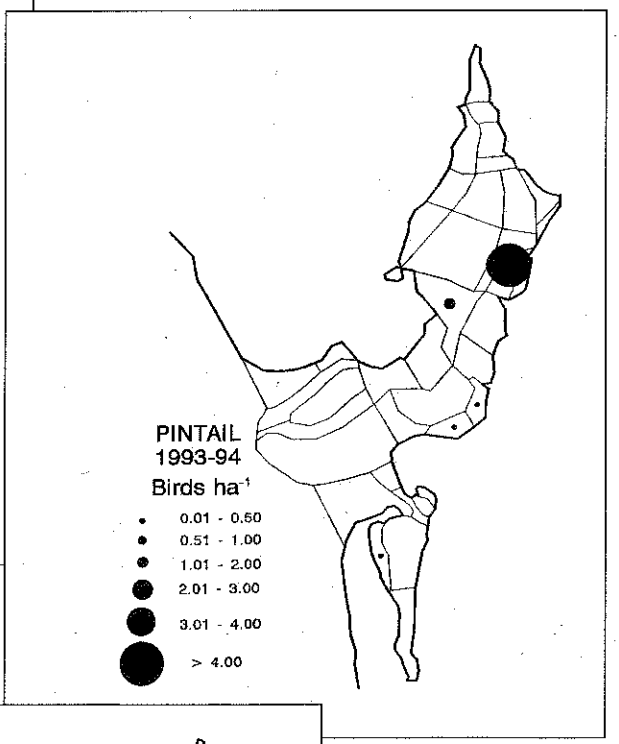
The Duddon is a large, sandy estuary, with sand dunes at Haverigg, Sandscale and North Walney Island flanking its mouth. In the more sheltered areas, particularly between Walney and the mainland, some mud occurs. There are saltmarshes on the inner third of the estuary and also off north Walney (Figure 4).

Bird distribution

In 1991-92, low tide counts were carried out as part of a study funded by British Gas, to monitor the effects of constructing a pipeline across the estuary (Warbrick *et al.* 1992). The patterns of distribution recorded by the 1993-94 counts for wildfowl species were very similar. Shelduck were recorded throughout the estuary except on the largest sandy mudflats. Apart from one count area in Scarth Bight and an area between Sandscale and Askam Pier, the highest numbers were found on the inner estuary. Of the other wildfowl species recorded in any numbers on the estuary, most had a very localised distribution. Pink-footed Geese were only observed on the saltmarsh north of Millom. The main concentration of Wigeon, on the other hand, was found off the north end of Walney Island. Pintail were either recorded in the river channel off Dunnerholme, or on the saltmarsh to the north of this headland (Figure 4).

Some of the wader distribution patterns differed slightly from those recorded in 1991-92, although most of the wader species still showed a clear preference for the eastern shore of the estuary, where most of the muddy areas are located. This pattern of distribution was particularly marked for Dunlin and Knot, which were recorded in large numbers along the length of the coast from Dunnerholme to the area between Walney Island and the mainland. In the 1991-92 winter, while this was the main area for Dunlin, smaller numbers were recorded further up and in the western half of the estuary. As in 1991-92, Ringed Plover were found in highest numbers towards the north end, near Dunnerholme, whereas Grey Plover were found in highest numbers in the section between Walney Island and the mainland. Apart from the presence of the muddier substrate in these areas, which would be a richer source of invertebrates, it is likely that the more sheltered aspect of these areas would make feeding there more successful than elsewhere in the estuary for these visual feeders (Pienkowski 1983). Oystercatchers also preferred these areas but were found in smaller numbers in the western half of the estuary and compared with the 1991-92 winter fewer were seen at the head of the estuary. Grey Plover, being solitary feeders, were recorded in densities of less than 0.9 birds ha^{-1} even in the areas with the highest numbers, whereas Knot were present in densities of up to 7.8 birds ha^{-1} (Figure 4). The patterns of fluctuation in numbers between months of different species recorded during the Low Tide Counts were typical for this estuary. Overall, most wader species appeared to be more widespread than during the 1991-92 winter. Fewer birds were recorded at the head of the estuary and on the western shore.





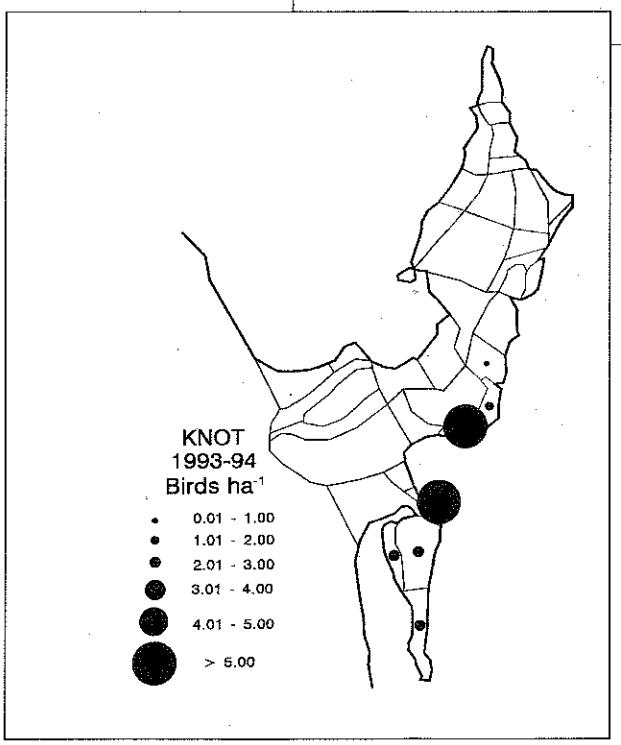


Figure 4. Site map and low tide distribution of selected waterfowl species in 1993-94 for the Duddon Estuary.

INNER THAMES ESTUARY
Greater London/Essex/Kent

Internationally important species: None

Nationally important species: Dunlin, Redshank

Site description

The Inner Thames is a sub-site of the Thames Estuary Core Counts site which has 12 internationally important species (Table 81). In the past, large areas of low marshy ground adjacent to this part of the estuary have been subject to claim for urban and industrial development, leaving a relatively small area of intertidal mud. Prior to 1960, it was heavily polluted and supported very few birds, but since then there has been a massive improvement in the pollution level resulting in large numbers of wildfowl and waders recolonising the intertidal flats (Prater 1981). The area covered as part of the Low Tide Counts extends from Creekmouth at Barking to Tilbury on the north shore and from Tripcock Ness at Thamesmead to Gravesend on the south shore (Figure 5).

Bird distribution

The main concentration of Redshank occurred on the mudflats at Stone Ness where they were present at a maximum density of more than 24 birds ha^{-1} (Figure 5). Numbers declined with distance from this site, which has been an important feeding area for waders for many years. A very high proportion of the Dunlin were also recorded here and on the mudflats directly opposite on the south shore, where they were present in densities of more than 35 birds ha^{-1} (Figure 5). A comparison with numbers recorded in previous years suggests that the number of Dunlin feeding within the Inner Thames at low tide has declined. One reason for this may be the unsuitability of the traditional roost site at West Thurrock. In 1993, the power station was closed down and the ash lagoon where the birds used to roost became overgrown. It is possible that the birds were forced to roost elsewhere and hence to feed outside the study area.

Ringed Plover numbers were also lower than in previous years, when large numbers were recorded feeding off Stone Ness. In contrast to the waders, wildfowl tended to occur further upstream. The highest concentrations of Brent Geese, Shelduck and Teal were all recorded between Creekmouth and Dagenham.

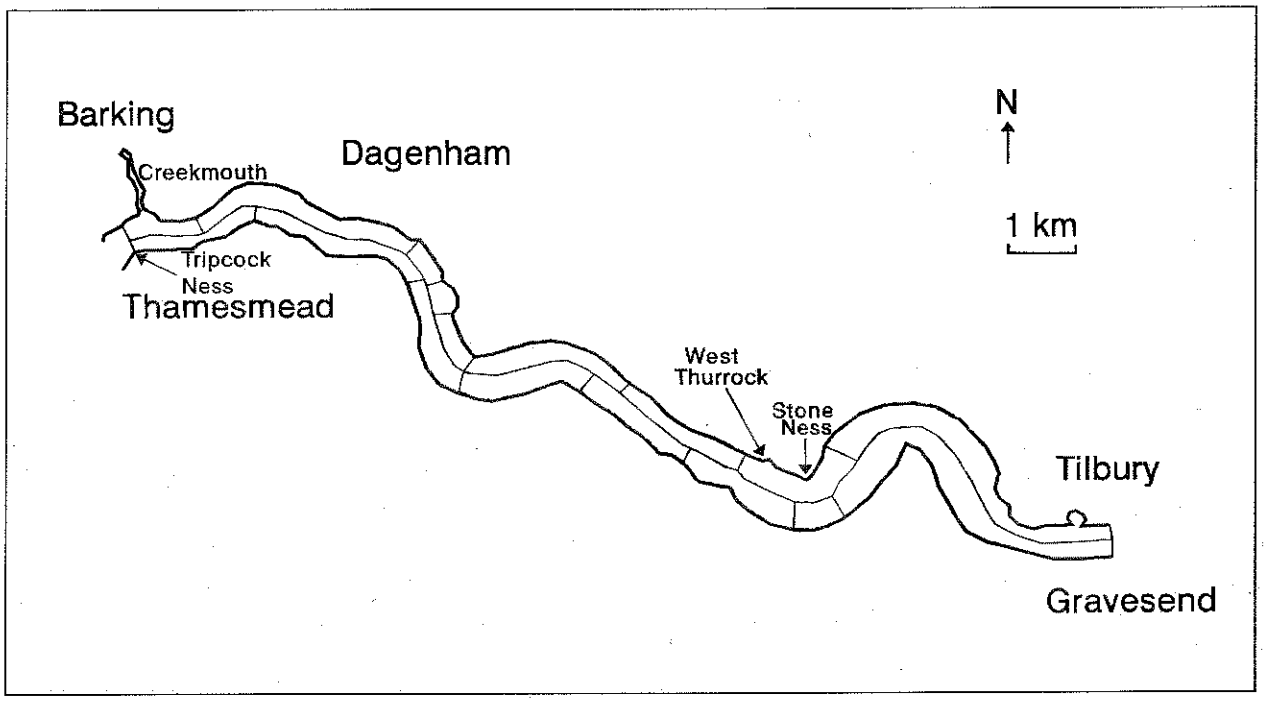
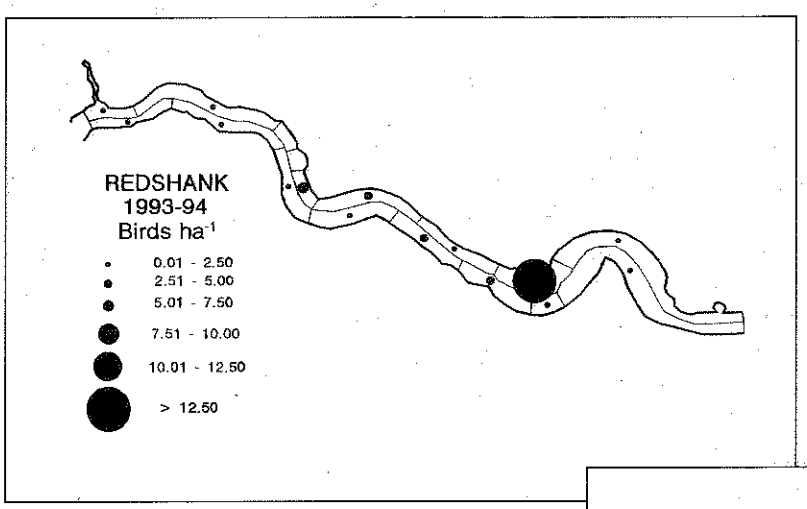
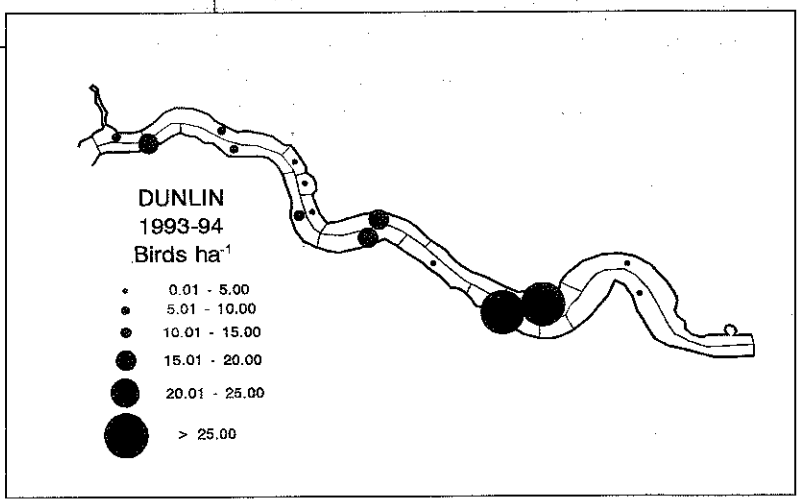


Figure 5. Site map and low tide distribution of selected waterfowl species in 1993-94 for the Inner Thames Estuary.





KINGSBRIDGE ESTUARY
Devon

Internationally important species: None

Nationally important species: None

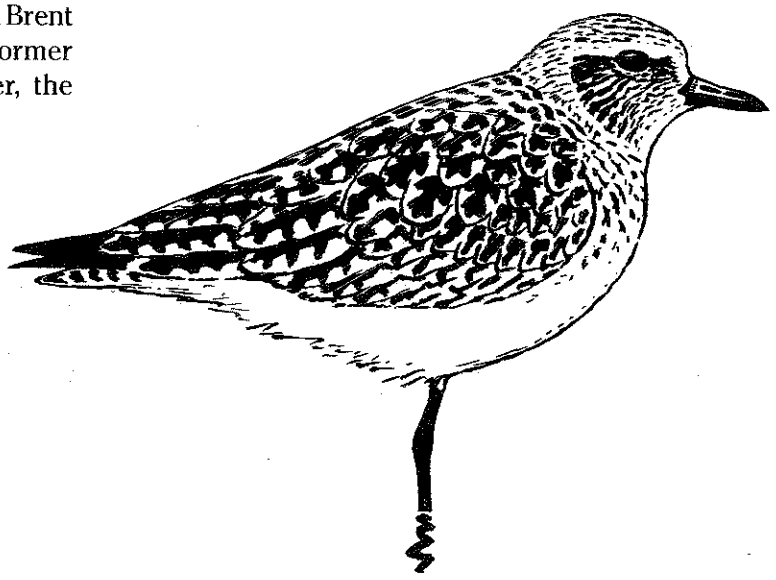
Site description

Seven drowned river valleys have formed this ria estuary in Devon, making it steep-sided and therefore allowing little saltmarsh development. The channels of the inner estuary are narrow and the flow of water sluggish, leaving a deep deposit of silt. The popularity of watersports has increased in recent years and is concentrated towards the mouth of the estuary. Apart from the main towns of Salcombe, in the south, and Kingsbridge, in the north, this picturesque estuary is surrounded by farmland (Figure 6).

Bird distribution

All of the main wintering wildfowl species found on the estuary were concentrated in the sections north of Halwell Point. The highest numbers of Wigeon (Figure 6) and Teal were found in the Blanksmill creek area which suffers very little disturbance and provides safe roosting and feeding areas. In contrast, the majority of the small numbers of Mallard recorded at low tide were in the two creeks either side of High House Point, probably due to the proximity of the feral duck population at Kingsbridge. Brent Geese and Shelduck, on the other hand, favoured the wider mudflats. Brent Geese were most numerous between Charleton Point and Wareham Point but were also found in relatively high numbers at the junction of Collapit and Blanksmill Creek. Both these areas hold large beds of eel grass (*Zostera angustifolia*). During the 1984-85 winter, Brent Geese were recorded exclusively within the former area (Waterhouse 1985). Since then, however, the population has increased further and may have 'overflowed' into these new areas as a result. Like several of the wader species, Shelduck were recorded in highest numbers between High House Point and Charleton and Gerston Points.

Oystercatcher, Redshank, Curlew and Dunlin were the four commonest wader species present at low tide. Redshank were widespread, but present in highest numbers on the mudflats between Charleton Point and High House Point. Dunlin also favoured this area but, because this is a species which feeds in flocks, they were much more localised (Figure 6). Curlew were ubiquitous but most numerous in three main areas: just south of Ham Point in Frogmore Creek, between Park Bay and Gerston Point, and in South Pool Creek. It has been suggested that they avoid areas which suffer the greatest human disturbance (Waterhouse 1985), however, Oystercatchers were recorded in similar areas, in similar numbers and were also widespread, suggesting that they were exploiting similar food supplies and that either disturbance was not affecting Curlew distribution or it was affecting both species in a similar way. Little Egrets added a touch of the exotic to the counts and, although they roosted communally, they tended to spread out and feed individually, being recorded in almost every count section at some time during the winter.



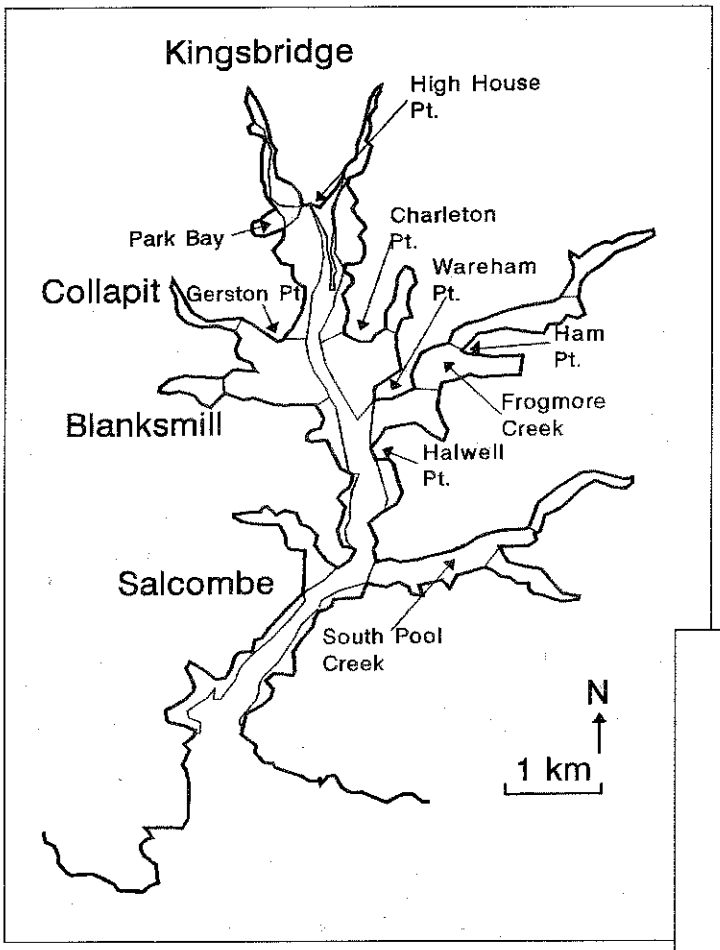
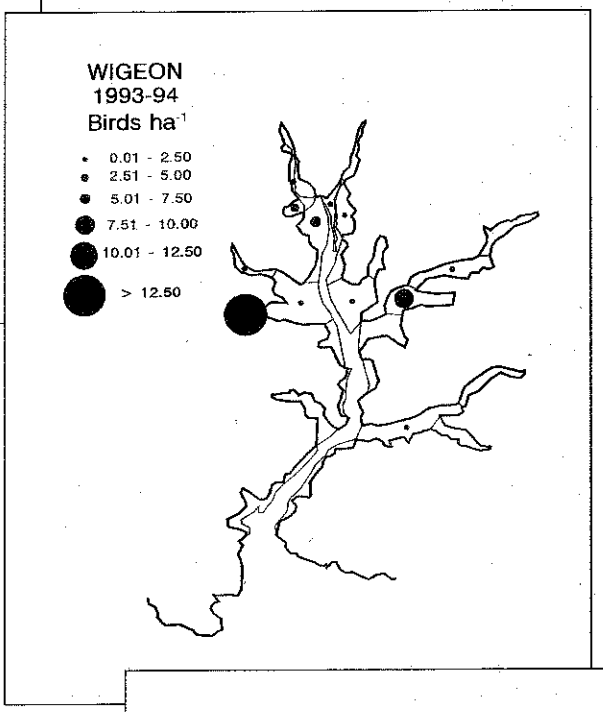
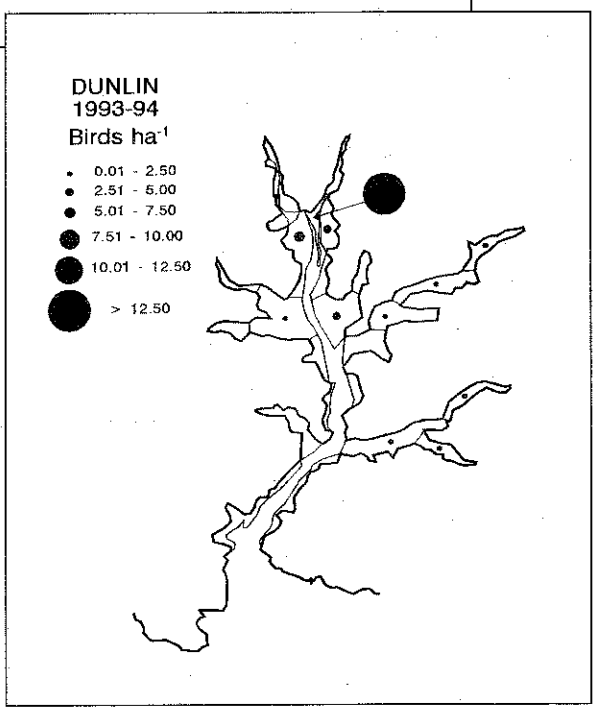


Figure 6. Site map and low tide distribution of selected waterfowl species in 1993-94 for the Kingsbridge Estuary.





LANGSTONE HARBOUR
Hampshire

Internationally important species: Dark-bellied Brent Goose, Dunlin

Nationally important species: Little Grebe, Cormorant, Shelduck, Shoveler, Red-breasted Merganser, Ringed Plover, Grey Plover, Black-tailed Godwit, Bar-tailed Godwit

Site description

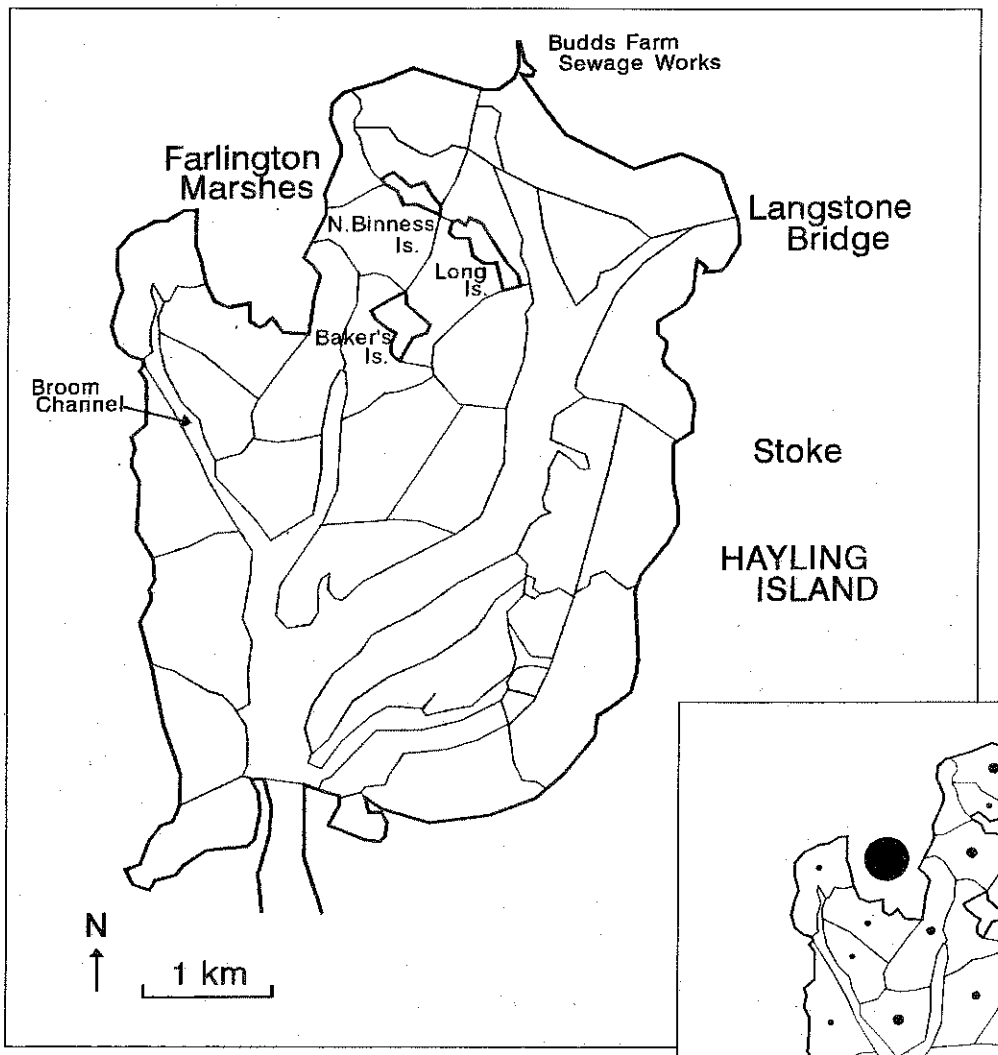
Langstone Harbour is now surrounded by urban development, although most of the land immediately adjacent to the shore is relatively open. The close proximity of Chichester Harbour, which is joined to Langstone Harbour by a narrow channel to the north of Hayling Island (Figure 7), means that there is regular interchange of some species between roost sites in one and feeding areas in the other. The main roost sites in Langstone Harbour are situated on the western part of Hayling Island, on Farlington Marshes, and on the low-lying islands in between (Prater 1981). The sediments exposed at low tide are mainly fine silts and organic matter, with a small area of sand near the harbour mouth (Tubbs 1977).

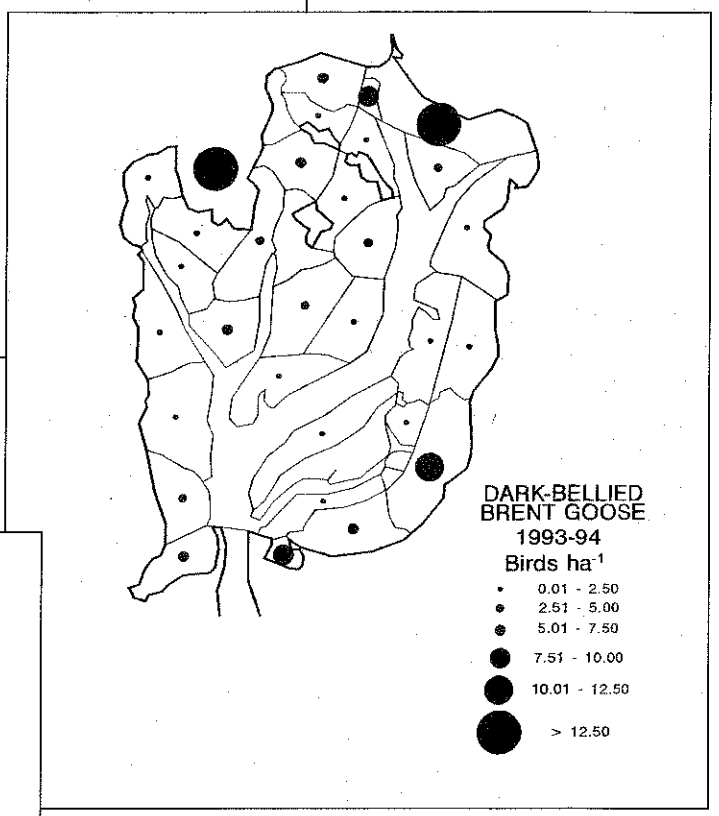
Bird distribution

Overall, the majority of wildfowl were recorded in two areas: Farlington Marshes and the area adjacent to Budds Farm sewage works. Farlington Marshes provides a relatively disturbance-free area of grazing on which the birds both feed and roost. The increasing volume of organic matter entering the harbour has also promoted the growth of green algae (*Enteromorpha*) which the grazing wildfowl have been able to exploit. The spread of green algae has been mirrored by the spread of eel grass (*Zostera*) which has benefited the wintering population of Brent Geese (Tubbs 1977). Thus, the mudflats adjacent to Budds Farm sewage works had some of the highest densities of Brent Geese recorded on them. Very high numbers were also observed on Farlington Marshes (Figure 7). Shelduck were also widespread, but concentrated mainly on the mudflats between Farlington Marshes and Bakers Island. This is an area which is free of algal growth and where the birds are therefore able to more easily use their characteristic feeding technique of moving their bills in an arc through the surface mud layers.

Many of the waders, for example Oystercatcher, Grey Plover, Black-tailed Godwit, Curlew, Redshank and Dunlin, showed a strong preference for the mudflats which lie to the north of a line through North Binness Island and Long Island towards Stoke and which are probably influenced most by the effluent from the Budds Farm sewage works. Oystercatchers, Grey Plover and Curlew in particular, although widespread throughout the estuary, were present in the highest numbers and in very high densities here (>13, >4 and >4 birds ha^{-1} respectively). Redshank were found in large numbers on the mudflats between Stoke and Langstone Bridge and at the end of Broom Channel. Dunlin were present in densities of >15 birds ha^{-1} in several parts of the harbour but the highest densities were recorded adjacent to the sewage works (Figure 7). Only two wader species showed a clear preference for the southern half of the harbour: Knot and Sanderling. Both species preferred the central and south-eastern areas of the estuary.

The pattern of occurrence of several species (Shelduck, Grey Plover, Lapwing, Dunlin, Bar-tailed Godwit) recorded during the Low Tide Counts revealed a peak in January consistent with an arrival of birds from the Wadden Sea (Prater 1981). By contrast, Black-tailed Godwit numbers recorded at low tide declined sharply from January onwards, possibly due to dispersal to other sites along the south coast.





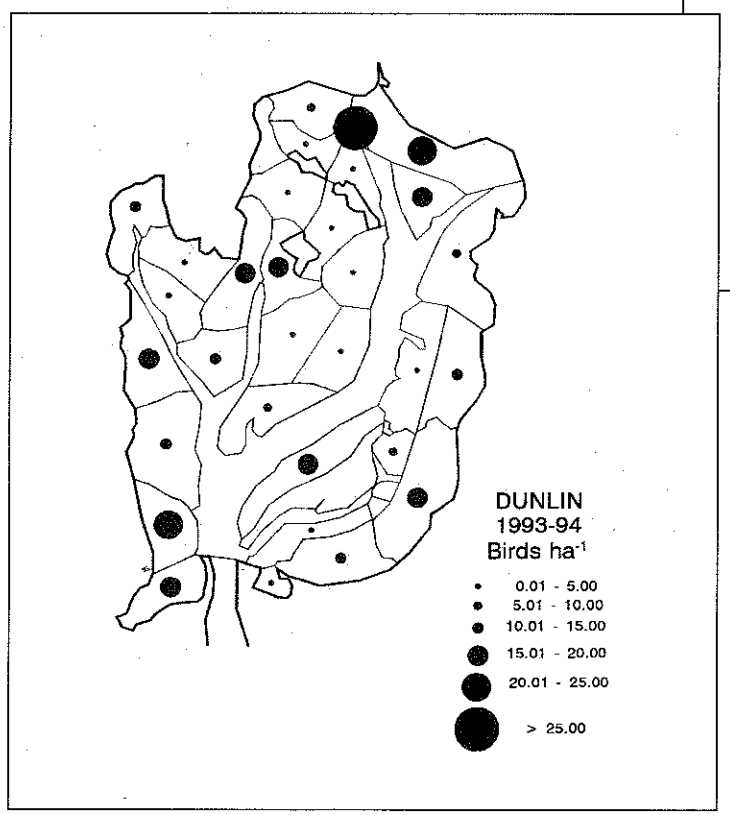


Figure 7. Site map and low tide distribution of selected waterfowl species in 1993-94 for Langstone Harbour.

POOLE HARBOUR
Dorset

Internationally important species: Shelduck, Black-tailed Godwit

Nationally important species: Cormorant, Dark-bellied Brent Goose, Pochard, Red-breasted Merganser, Avocet, Curlew, Redshank

Site description

Although two rivers, the Frome and the Piddle, enter Poole Harbour from the west, there is relatively little freshwater inflow (Figure 8). The growth of Poole and Bournemouth means that the northern half of the harbour is very built up and the adjacent waters heavily used by commercial and leisure craft. This area has sandy beaches interspersed with narrow-mouthed bays which are muddier and contain areas of saltmarsh. The southern half is largely undeveloped and consists of large areas of mudflats, islands, saltmarsh and adjacent low-lying sandy heathland. The tidal pattern of the harbour is particularly complicated, making it difficult to identify the preferred feeding grounds of the very large numbers of wildfowl and waders recorded there.

Bird distribution

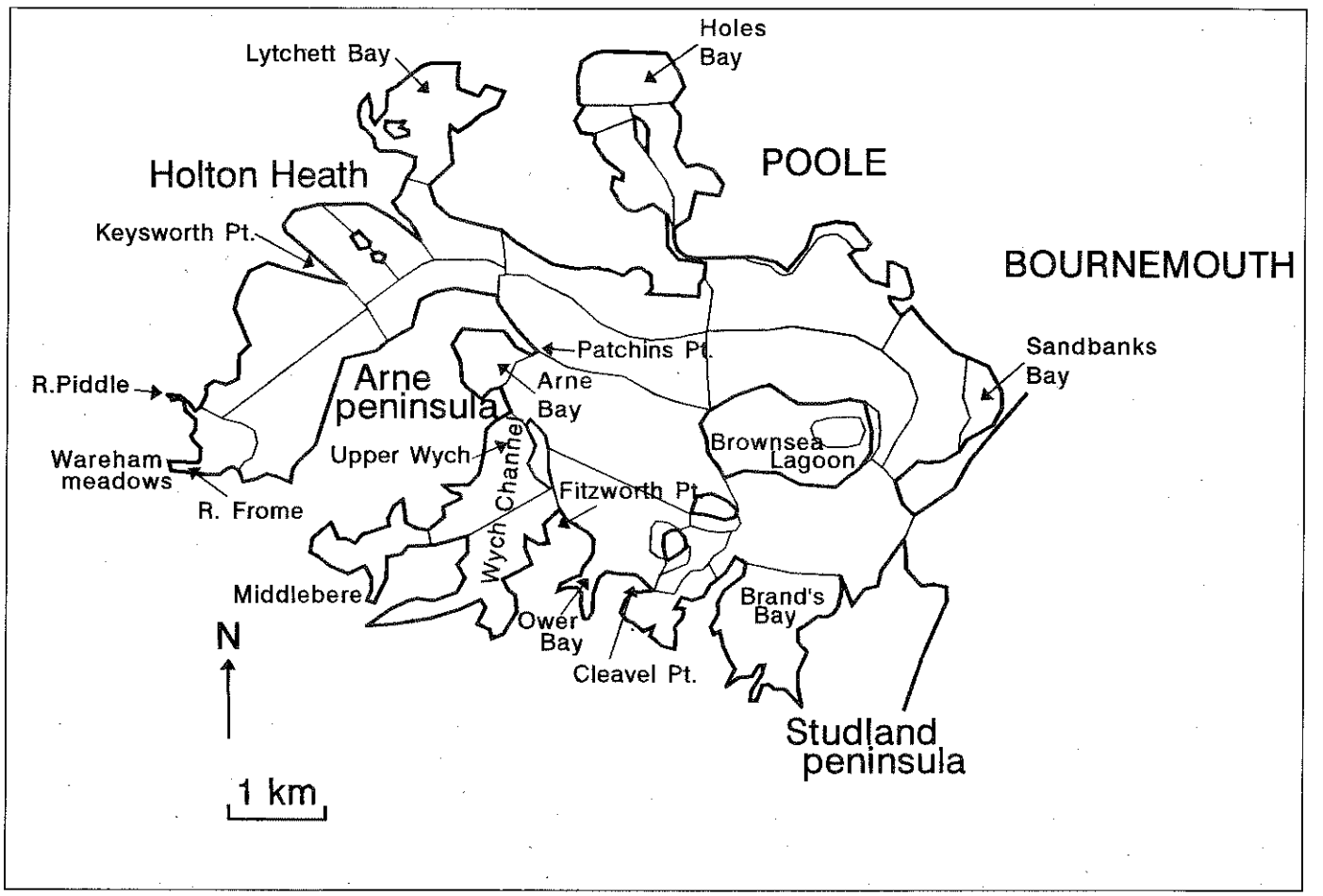
In 1984-85, low tide counts were carried out as part of a study funded by BP, to provide information on waterfowl distribution for incorporation into their shoreline clean-up strategy and oil-spill contingency plan documents (Collins 1985). As expected, the majority of birds were recorded in the undeveloped or undisturbed parts of the harbour. The grazing wildfowl in particular favoured the sheltered bays between the Arne and Studland peninsulas, where there are large areas of saltmarsh but within this area, the distribution patterns differed considerably between species. Of the areas where high densities of Brent Geese and Shelduck were observed, Brands Bay was the main feeding area for both species. In comparison, during the Low Tide Counts in 1993-94, the results were similar for Shelduck (Figure 8) but the largest number of Brent Geese were recorded between Middlebere and Upper Wych, west of Round Island.

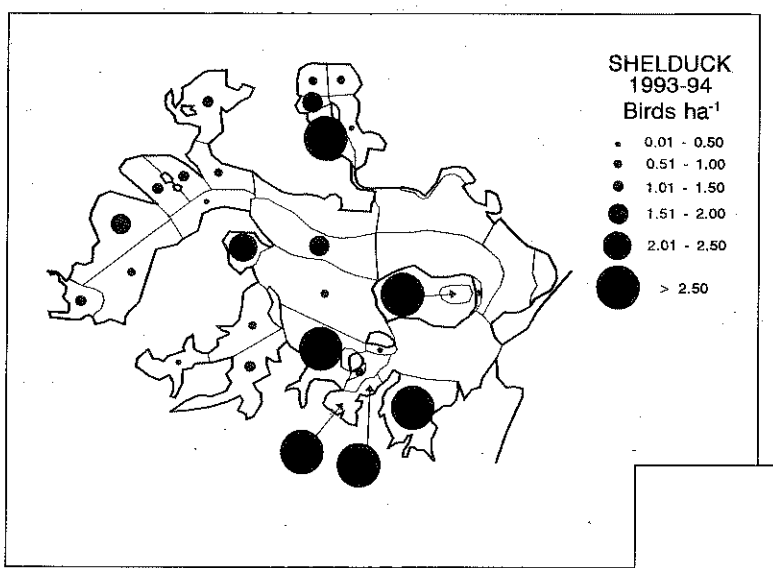
The wader distribution patterns were consistently similar to those recorded in 1984-85. Oystercatchers were widespread, but by far the highest numbers were recorded at Holton Heath. This area also had the highest mean feeding count in 1984-85 but the birds' preference for the area was not as striking, similar numbers being observed in Arne Bay and on Round Island. Avocets were fairly localised, tending to occur in flocks of 200-300 either in Brownsea Lagoon or in Wych Channel, although a few individuals were recorded elsewhere in the southern half of the harbour. Interestingly, these are the same areas favoured by the small numbers wintering in the harbour in 1984-85. Ringed Plover were also very localised and only present in small numbers, occurring mostly on sandy or shingly areas such as Patchins Point. In the past, this species has been shown to exhibit a seasonality in its use of areas within the harbour, with Patchins Point relatively under-used during November to February (Bull 1953). Grey Plover, which are habitually solitary feeders, occurred in small numbers in most of the areas in the southern half of the harbour, the same pattern as observed in 1984-85.

The distribution of Lapwing, Curlew and Black-tailed Godwit appeared to be closely linked to the proximity of low-lying grassland. Collins (1985) recorded Curlew feeding over the high tide period in fields at Fitzworth Point, Brands Bay, Cleavel Point, Wareham Meadows, Keysworth and Ower Bay. Lapwing feed on farmland but usually use the intertidal area for roosting and Black-tailed Godwit regularly feed on Wareham Meadows when they are flooded (Collins 1985). Only relatively small numbers were recorded and the majority of these were recorded in Sandbanks Bay. All the records were from the south-eastern part of the harbour, contrasting with Black-tailed Godwit, which favoured muddier areas in Newton Bay and at the mouth of the Rivers Frome and Piddle (Figure 8). Bull (1953) also noted these preferences but showed that Black-tailed Godwit gradually moved eastwards during the winter.

The largest numbers of Dunlin were observed to the north of Keysworth Point, but flocks of up to 500 birds were recorded in most parts of the harbour. The overall distribution pattern is very similar to that recorded in 1984-85 but differs quite radically from that described by Bull (1953), who described the main winter population as confining itself almost entirely to the eastern half of the harbour.

The highest numbers of Redshank occurred at Keysworth Point, Lytchett Bay and Holes Bay. This may be an indication of the presence of high densities of one of their preferred prey species due to organic enrichment. In Lytchett Bay and Holes Bay in particular, the water flow is sluggish and therefore does not allow organic effluent to disperse easily. This pattern of Redshank distribution is very similar to that shown by Collins (1985).





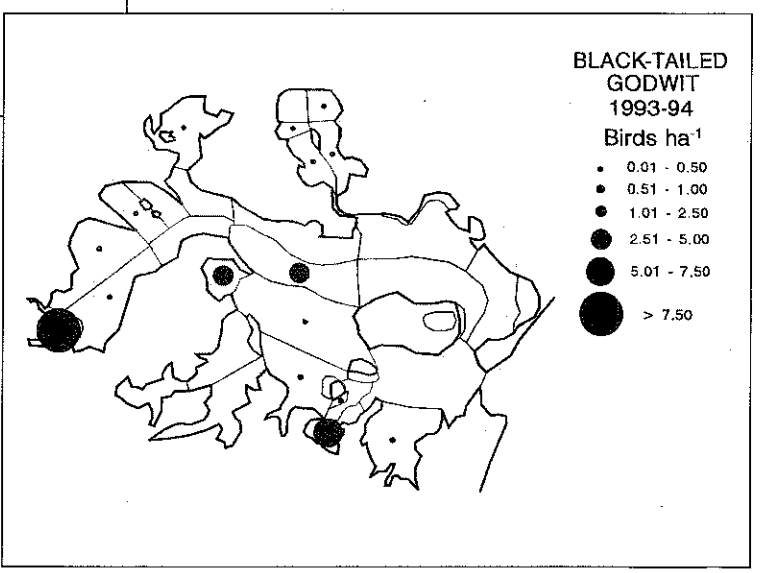


Figure 8. Site map and low tide distribution of selected waterfowl species in 1993-94 for Poole Harbour.

STRANGFORD LOUGH
Co. Down

Internationally important species: Light-bellied Brent Goose, Knot, Redshank

Nationally important species: Shelduck, Gadwall, Teal, Shoveler, Goldeneye, Red-breasted Merganser, Oystercatcher, Ringed Plover, Golden Plover, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew

Site description

Strangford Lough is an almost land-locked sea lough on the east coast of Northern Ireland. The glacial features of the lough include many drumlin islands (Figure 9). Those off the western shore are well-developed and shield muddy bays. The islands along the north-eastern shore are eroded by exposure to the predominantly south-western airstream and so tend to be lower and smaller (Langston 1990). Sediments in the sheltered bays of the western shore and the south-west corner consist of fine muds; muddy sand at the northern end of the lough forms extensive open tidal flats. The eastern shore is characterised by small muddy areas strewn with boulders. The variety of depths, substrate and current regimes contained within a restricted area means that the lough has a rich diversity of marine invertebrates (Pritchard 1982a). It is the single most important wintering site for the population of Light-bellied Brent Geese which breeds in Arctic Canada and North-east Greenland and winters predominantly in Ireland.

Bird distribution

The wide northern mudflats hold the majority of most species of waders and grazing wildfowl. These mudflats have rich beds of eel grass (*Zostera*), which are among the most prolific in Europe (Pritchard 1982a & b). Brent Geese and Wigeon are attracted to graze here and Shelduck and waders feed on the associated fauna. The main concentrations of most species therefore occurs at the northern end of the lough. Peak numbers of Brent Geese and Wigeon occur in November, by which time substantial numbers have moved further south, along the western and eastern shores. As the winter progresses, the southward dispersal continues and their numbers decline (Fox *et al.* 1994). During the Low Tide Counts, the distribution was fairly uniform and the mean densities of Brent Geese were relatively low (<100 birds ha^{-1}) in most parts of the lough with the exception of the bay between Long Island and the mainland, north of Ardmillan (Figure 9). However, if the distribution is plotted for each month separately, similar changes in distribution to those described by Fox *et al.* (1994), using the Core Counts, are shown to have occurred. Likewise, the highest mean densities of Wigeon were almost all found in the western half of the lough, between the Comber estuary and the Quoile, but the month-by-month results illustrate the southward redistribution and the decline in numbers through the winter.

In general, the largest numbers of waders were found on the largest mudflats in the north. The majority of Oystercatchers, for example, were recorded on the mudflats to the north of a line between Whiterock and Greyabbey, with very many fewer found in the smaller bays further south.

Knot also favoured the northern end of the lough, but were found in particularly high numbers from the Comber estuary down to Mahee Island and across at Greyabbey, demonstrating a difference in preferred prey (Figure 9). Ringed Plover were only present in relatively small numbers and tended to be very localised. At first glance, the overall distributions of the two species of godwit seem very similar. However, if their distribution is superimposed on sediment maps, their preference for different sediment types becomes clear. In common with many other estuaries, Bar-tailed Godwit are found on sandier areas nearer the head of the lough and Black-tailed Godwit on the muddier ones nearer the Comber estuary and on the sheltered inland side of some of the islands. Although Dunlin were present in similar numbers to Knot, they occurred in much smaller flocks and were much more widespread, perhaps because they were able to exploit a different food source.

Redshank distribution was typical of the species, concentrating on the muddy creeks at the mouth of the Comber and in the muddier areas around the islands and in the bays throughout the lough (Figure 9). Golden Plover, Lapwing and Curlew were the most widely dispersed species. The largest numbers of Golden Plover and Lapwing, species which mainly use the intertidal zone for roosting, were found in the Comber estuary. Curlew, which are able to exploit a variety of different habitats for feeding, were ubiquitous. The largest numbers, however, were recorded in the northernmost corner of the lough between the sewage works and Newtownards.

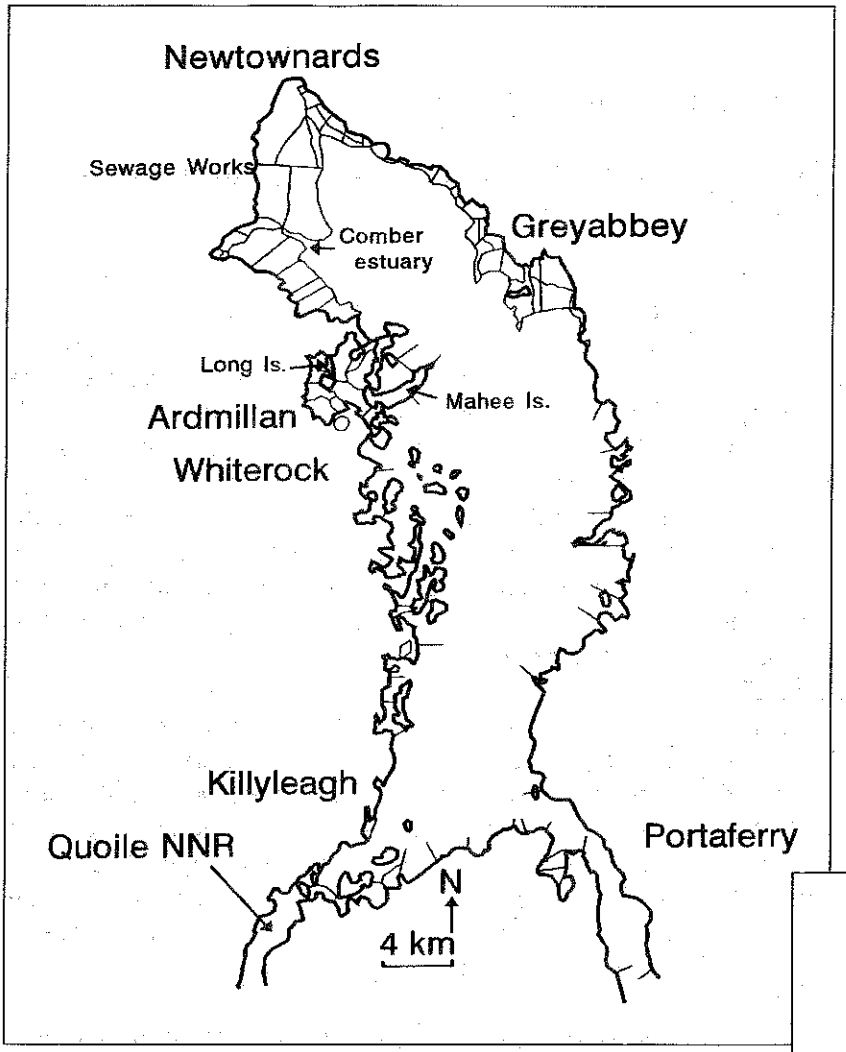
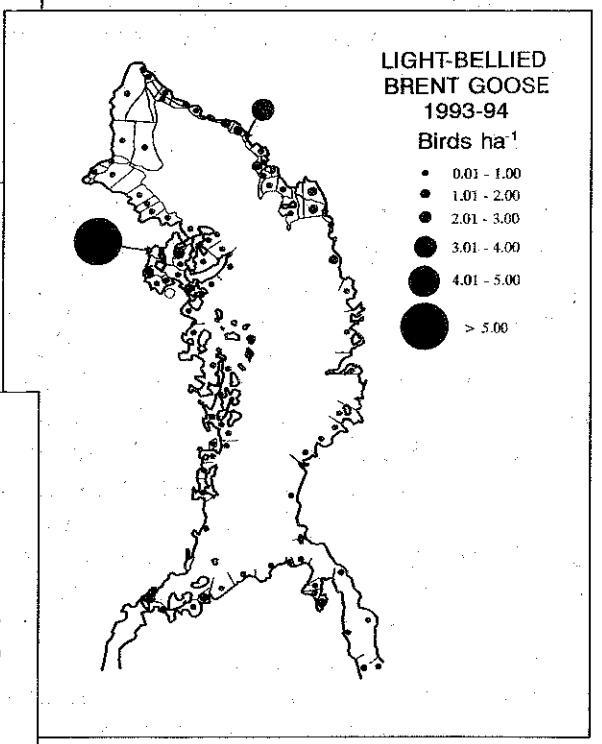
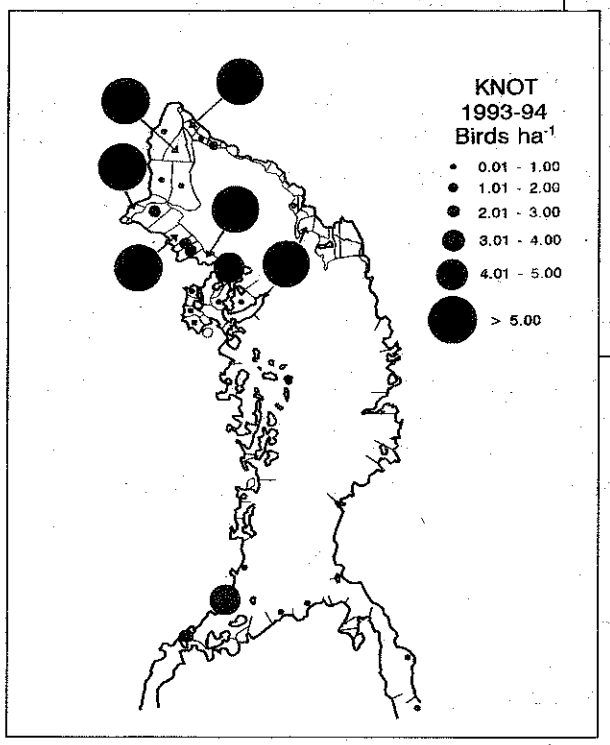


Figure 9. Site map and low tide distribution of selected waterfowl species in 1993-94 for Strangford Lough.





TAY ESTUARY
Tayside/Fife

Internationally important species: Eider, Bar-tailed Godwit, Redshank

Nationally important species: Common Scoter, Goldeneye, Red-breasted Merganser, Goosander, Sanderling

Site description

The Tay estuary can be divided into two sections: the Firth of Tay, downstream of the road and rail bridges, and the Inner Tay, upstream of them. The Firth of Tay has two large sand-dune systems, Tentsmuir Point and Buddon Ness, either side of its mouth. There are a few stony scars and mussel beds with sand-banks further offshore (Prater 1981). Upstream from Dundee and Tayport, the estuary widens and relatively large sand or muddy sandflats appear on the northern shore, with a band of soft mud just below the high water mark. The upper part of the north shore is lined by a dense Phragmites bed (Khayrallah & Jones 1975). The southern shore is much narrower and steeper sided and is an admixture of mud, sand, pebbles and bedrock. The estuary is tidal as far as Perth, but the saline influence does not usually extend beyond Newburgh (Figure 10).

Bird distribution

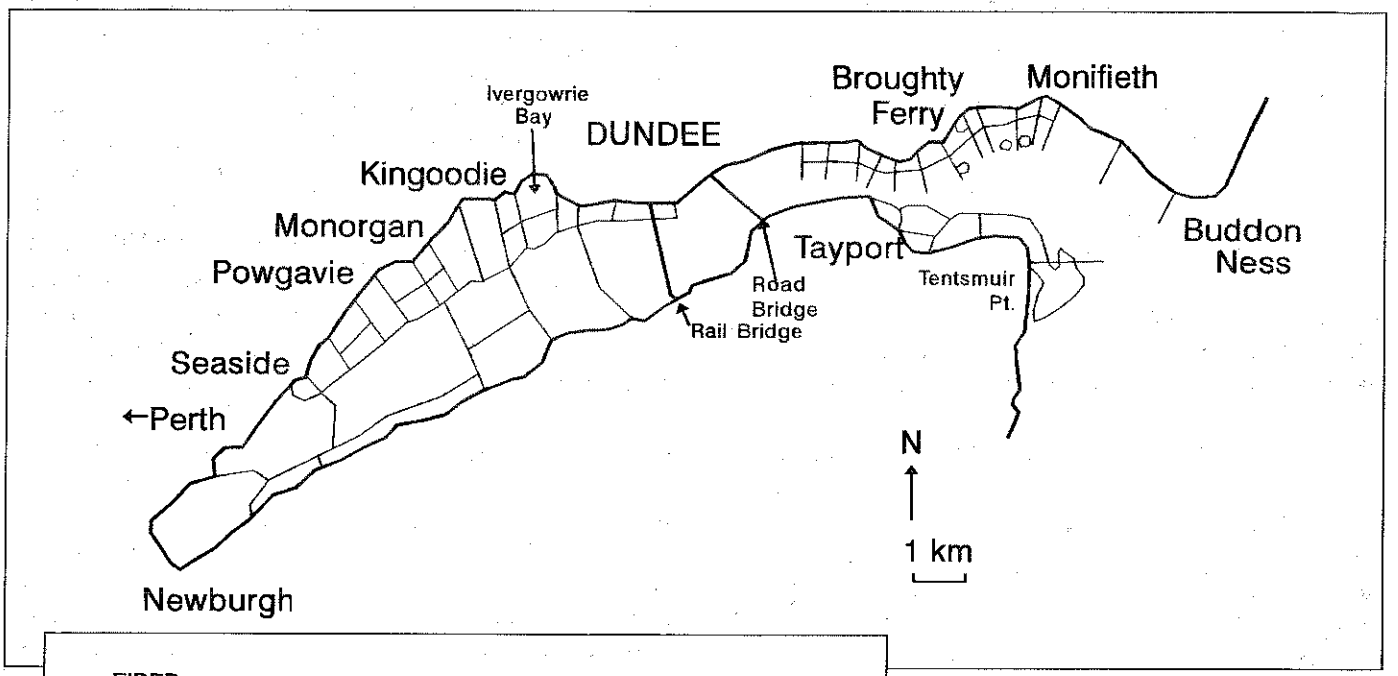
The Eider flock is of UK outstanding importance with estimates of up to 30,000 having been made at high tide. The main concentration recorded at low tide was situated towards Tentsmuir Point and numbered over 500 birds (Figure 10). Goldeneye were mainly found just to the west of the rail bridge. Pink-footed Geese were only recorded in significant numbers in November with very few individuals present at low tide during rest of the winter. This was probably due to this species' habit of feeding inland during the day, particularly during the latter half of the winter. Similarly, Greylag Geese were only recorded in large numbers in January. Shelduck, Wigeon and Mallard were the most numerous duck species recorded regularly during the Low Tide Counts. Shelduck were present in low densities in the muddy areas off Tayport and along the north shore between Dundee and Newburgh. Wigeon were only recorded east of a line between Broughty Ferry and Tayport, although the reasons for this are unclear. Mallard, on the other hand, were widespread throughout the estuary.

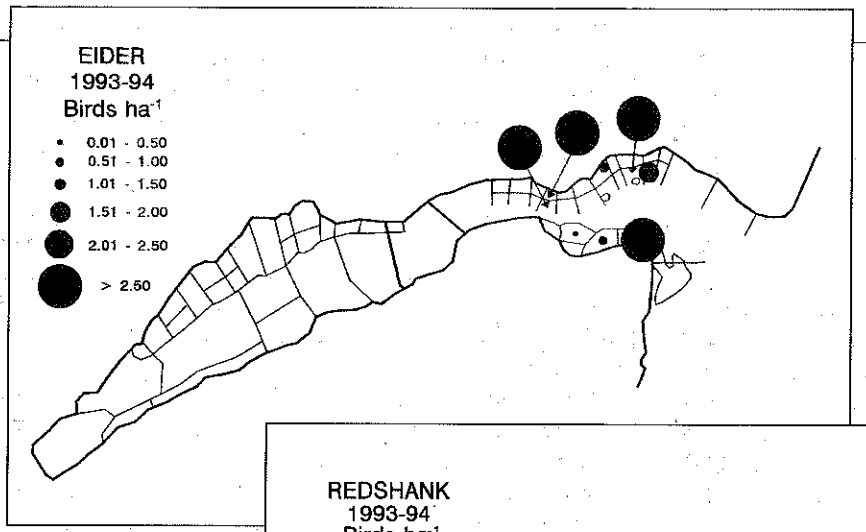
The patterns of distribution for wader species were very similar to those recorded in a one-off count carried out by volunteers in January 1989 (Laing & Taylor 1993). The majority of waders present on the inner estuary were found on the north shore between Invergowrie Bay and Powgavie where it is muddiest. The main concentrations of Dunlin were recorded in Invergowrie Bay and on the flats off Kingoodie. Redshank were ubiquitous but particularly high densities of Redshank were recorded off Broughty Ferry (Figure 10), possibly due to the presence of a sewage outfall in this area. The area of mud adjacent to the airport was one of the main areas for Curlew and Bar-tailed Godwit (Figure 10), which were also located in high numbers on or near the mussel scars and stony areas off Tayport and Broughty Ferry respectively.

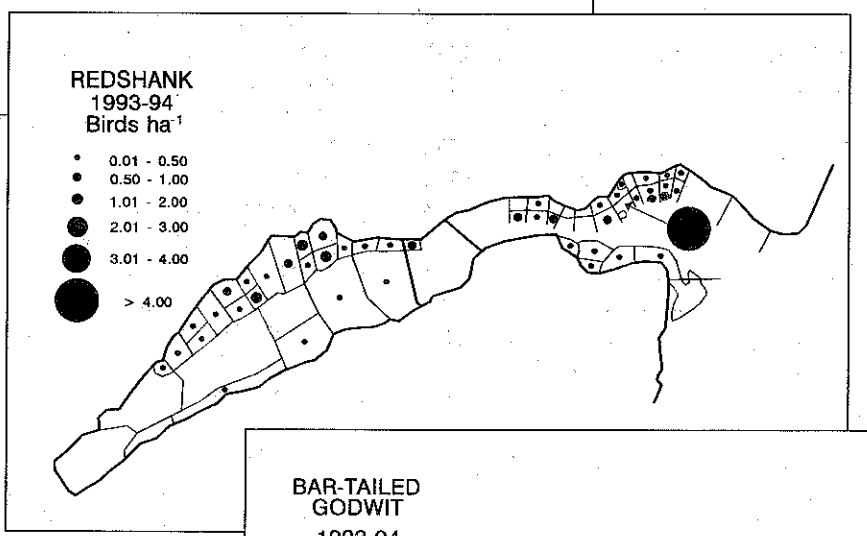
Oystercatchers were widespread throughout the outer estuary but the main concentrations were present off Tayport and on the opposite shore at Monifieth. Here they concentrated on the mussel scars and therefore their densities were very high. On one in particular, the average density recorded was 114 birds ha^{-1}. On the inner estuary, they were present in lower numbers between Invergowrie Bay and Powgavie.

As in 1989, Golden Plover were found in larger numbers above Seaside than below Powgavie on the inner estuary. However, much higher numbers were recorded on the outer estuary at Tayport. In contrast, much higher numbers of Lapwing were found on the inner estuary, mainly above Seaside. Only two species present were not recorded on the inner estuary: Grey Plover and Sanderling.

These 1993-94 Low Tide Counts confirmed the patterns of distribution recorded in the single low tide count carried out in January 1989 (Laing & Taylor 1993). On the inner estuary, the concentration on the Invergowrie Bay to Powgavie stretch was probably due to the rich feeding round the Invergowrie sewage outfall. A burn which flows into the bay at Monorgan also brings out some organic material. The diversity of marine invertebrates is comparatively low in the inner estuary, declining rapidly above Invergowrie due to the overall decline in salinity and the extremely large variations in salinity which occur every tidal cycle (Khayrallah & Jones 1975). This probably accounts for the very low numbers of birds recorded above Powgavie.







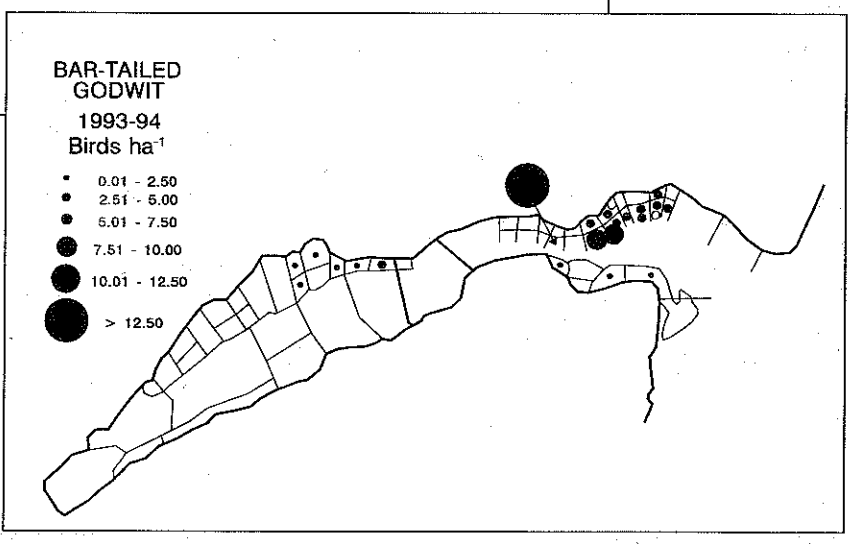


Figure 10. Site map and low tide distribution of selected waterfowl species in 1993-94 for the Tay Estuary.

WATERFOWL COUNTS IN THE REPUBLIC OF IRELAND, 1993-94

Widespread counts of waterfowl in the Republic of Ireland began in 1967 and since then have been organised, often jointly, by Clive Hutchinson, Ralph Sheppard, the Irish Wildbird Conservancy (IWC) and the National Parks and Wildlife Service (NPWS). Results from the most recent comprehensive survey, during 1984 to 1987, were published in *Ireland's Wetland Wealth* (Sheppard 1993). Throughout, the main focus of activity has usually been in January, with the aim of contributing to international population totals through the International Waterfowl Census, co-ordinated by the International Waterfowl and Wetlands Research Bureau (IWRB). With the co-operation and permission of IWC, NPWS and IWRB, data are presented here to complement that collected by WeBS and, in particular, to provide context to the counts made in Northern Ireland. In all, 67 sites were covered during the midwinter counts (Figure 11), although, as for WeBS, many of these comprised more than one count sector. A system of prioritising sites ensured that, as far as possible, all of the most important sites in the country were covered. Total counts of each species are given in Table 83.

Table 83. TOTAL NUMBERS OF WATERFOWL RECORDED IN THE REPUBLIC OF IRELAND, JANUARY 1994.

Wildfowl at all sites	**Jan**
Red-throated Diver	11
Great Northern Diver	52
diver spp.	1
Little Grebe	298
Great Crested Grebe	755
Slavonian Grebe	2
grebe spp.	5
Cormorant	1,081
Little Egret	5
Grey Heron	255
Mute Swan	1,636
Bewick's Swan	259
Whooper Swan	2,200
Bean Goose	2
Pink-footed Goose	18
Greenland White-fronted Goose	8,933
Greylag Goose	2,980
Canada Goose	33
Barnacle Goose	1,228
Brent Goose	9,740
Shelduck	9,564
Wigeon	34,544
American Wigeon	1
Gadwall	180
Teal	15,292
Mallard	7,871
Pintail	642
Blue-winged Teal	1
Shoveler	1,036
Pochard	2,970
Ring-necked Duck	1
Tufted Duck	2,269
Scaup	790
Eider	19
Long-tailed Duck	5
Common Scoter	265
Velvet Scoter	1
Goldeneye	768
Red-breasted Merganser	786
Goosander	14
Moorhen	232
Water Rail	9
Coot	2,853
TOTAL WILDFOWL	**109,347**

Waders at all sites	**Jan**
Oystercatcher	18,147
Ringed Plover	2,669
Golden Plover	54,737
Grey Plover	3,284
Lapwing	88,142
Knot	9,778
Sanderling	994
Little Stint	1
Purple Sandpiper	100
Dunlin	64,903
Ruff	16
Snipe	894
Jack Snipe	146
Woodcock	66
Black-tailed Godwit	5,433
Bar-tailed Godwit	7,837
Whimbrel	1
Curlew	23,300
Spotted Redshank	15
Redshank	8,835
Greenshank	227
Green Sandpiper	10
Wood Sandpiper	1
Turnstone	1,964
TOTAL WADERS	**291,500**
Gulls at all sites	
Black-headed Gull	26,446
Common Gull	2,239
Lesser Black-backed Gull	280
Herring Gull	4,864
Iceland Gull	1
Glaucous Gull	1
Great Black-backed Gull	1,173
gull spp.	10
TOTAL GULLS	**35,014**
TOTAL WATERFOWL	**435,861**

The total number of wildfowl counted in the Republic of Ireland in 1993-94 was similar to that in the Northern Ireland, although under-recording probably affected counts of waterfowl in the Republic to a greater degree than those in the North. Nevertheless, the totals of several species were particularly noteworthy, including Great Northern Diver and all three swan species, which were at least as abundant as in Northern Ireland. A high proportion of the Greenland White-fronted Geese and nearly all of the Icelandic Greylags believed to winter in Ireland appear to have been covered by the count network. Similarly, a high proportion of the Brent Geese that pass through Strangford Lough in October were picked up further south later in the winter, although, as happens in Scotland, many Barnacle Geese wintering on uninhabited, offshore islands were missed. Higher numbers of Shelduck and especially Wigeon were found in the Republic whilst the numbers of Teal and Shoveler were particularly impressive when compared with other species. Conversely, numbers of diving duck and Coot were much smaller in the South, despite the large number of loughs, due to the massive concentrations on Loughs Neagh & Beg in the North.

Counts of waders in the Republic of Ireland, on the other hand, far outnumbered those in the North. Also noteworthy is the species composition which, whilst broadly similar throughout Ireland, was markedly different from Great Britain. Of Oystercatcher, Knot and Dunlin, the three most abundant species in Britain, only the last was similarly common in the Republic of Ireland. Instead, Lapwing and Golden Plover contributed a large proportion of the total, whilst Curlew numbers were also comparatively high. Numbers of Black-tailed Godwit and also Jack Snipe greatly outnumbered counts in the North and were on par with totals for Great Britain.

Table 84. Total waterfowl counts at principal sites in the Republic of Ireland, January 1994

Wexford Harbour & Slobs	42,469
Dundalk Bay	38,977
Dublin Bay	35,056
Cork Harbour	31,473
Lough Swilly	19,102
Ballymacoda	15,819
Boyne Estuary	13,796
Rogerstown Estuary	12,700
Cull & Killag	12,263
Inner Galway Bay	12,087
Lee Reservoir	10,524
Sligo Bay	10,264

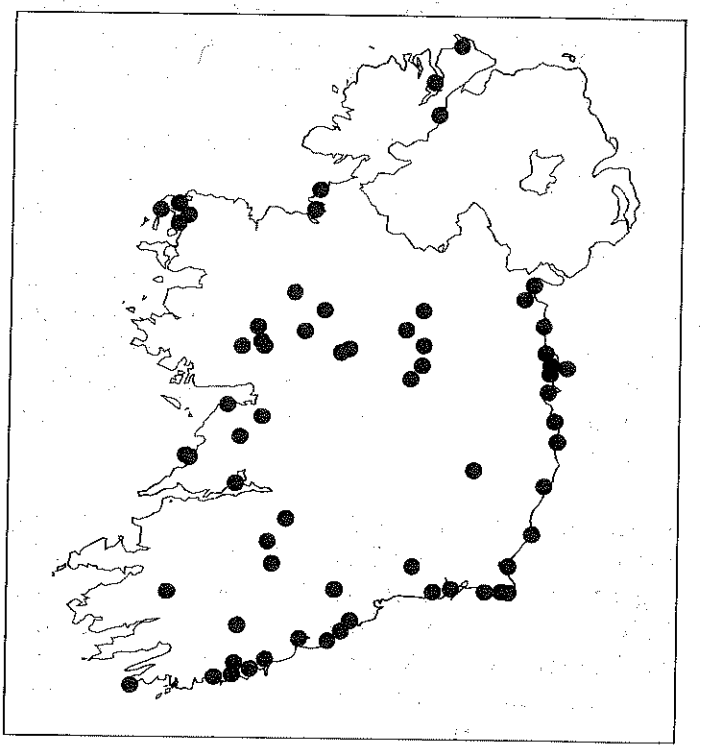


Figure 11. Location of sites covered in the Republic of Ireland, January 1994

Four sites in the Irish Republic supported more than 30,000 waterfowl, with another nine holding at least 10,000 (Table 84). Although these counts may seem considerably smaller than at key sites in the UK, it must be remembered that data from only one count have been presented here. The use of several counts throughout the winter, as for WeBS, would undoubtedly increase these totals.

The major concentrations of many species were found at the sites in Table 84. Peak counts of Great Crested Grebe (336) and Cormorants (158) were both made at Cork Harbour. Lough Swilly recorded the highest count of Mute (156) and Whooper Swans (487), whilst the largest count of Bewick's Swans was at Cull & Killag (135). Wexford Slobs held the vast majority of White-fronted Geese (8,119). There were three flocks of more than 500 Greylags, presumably Icelandic in origin, with that at Stabannan Bog (1,110) being the largest. The count of 800 Barnacle Geese at Trawbreaga Bay was far in excess of any others whilst Brent Geese were most abundant at Dublin Bay (2,100) and Wexford Slobs (1,951). Cork Harbour (2,812) and Dublin Bay (1,295) held the key concentrations of Shelduck. Mid Clare Lakes (4,810) was the most important of the 11 sites holding in excess of 1,000 Wigeon and Dublin Bay (1,727) the most important of five sites with 1,000 or more Teal. Mallard were widely spread in smaller numbers, with the count at Ballyhaunis Lakes (1,385) twice the size of the next

highest total. Counts of 390 Pintail and 370 Shoveler, both at Dublin Bay, were considerably greater than others of these species. Only a handful of sites held over 100 Pochard or Tufted Duck, Loughs Kinale & Derragh and Lough Owel both holding 500 of the former, a count of 300 at Lough Ennell being the largest of the latter. Over half the total count of Scaup was recorded at Wexford Harbour (480), whilst only two sites held over 100 Common Scoter. The highest count of Goldeneye was at Lough Swilly (120), whilst Inner Galway Bay (220) held over a quarter of all Red-breasted Mergansers. Just four sites supported more than 100 Coot, the count at Lough Owel (1,350) being by far the largest.

Oystercatcher numbers exceeded 1,000 at four sites, the count at Dundalk Bay (5,438) being much the highest. Similarly, numbers of Ringed Plover in Inner Galway Bay (800) were well above all other counts. Nineteen sites held 1,000 or more Golden Plover, counts on the Boyne Estuary (7,400) and at Ballymacoda (6,400) being the most significant. Wexford Harbour & Slobs (1,000) held the highest number of Grey Plover. In all, 27 sites held 1,000 or more Lapwing, with Wexford Harbour & Slobs (8,862) and Dundalk Bay (8,112) the most notable of the five sites supporting 5,000 or more individuals. The count of Knot in Dublin Bay (4,620) surpassed all others by a considerable margin. There were 17 counts of more than 1,000 Dunlin, with four of these, namely Cork Harbour (9,337), Dublin Bay (8,200), Wexford Harbour & Slobs (7,100) and Lough Swilly (6,718), exceeding 5,000. The counts of 238 Snipe and 117 Jack Snipe at Ballyhaunis Lakes were particularly impressive and the largest for both species. Two sites, Wexford Harbour & Slobs (1,280) and Blackwater Callows (1,111), held over 1,000 Black-tailed Godwits, and two, namely Dublin Bay (2,300) and Wexford Harbour & Slobs (1,518), held over 1,000 Bar-tailed Godwits. Seven sites recorded 1,000 or more Curlew, with Wexford Harbour & Slobs (2,298) again the largest. Cork Harbour (2,096) and Dublin Bay (1,287) held the most significant concentrations of Redshank whilst four sites supported 100 or more Turnstone, the count at Bog of the ring Balrothery (417) being the highest.

Dundalk Bay held the highest count of both Black-headed Gulls (10,000) and Herring Gulls (2,000), whilst Sligo Bay held the peak counts of both Common Gulls (577) and Great Black-backed Gulls (610). Lesser Black-backed Gulls were most abundant on Tacumshin Lake (103).

Following the launch of I-WeBS in late autumn 1994, waterfowl monitoring in the Republic of Ireland will be further enhanced. Notably, the availability of counts for several months of the winter will provide information of the importance of the country at other times and may broadly indicate movements between here and Northern Ireland or Great Britain. Certainly, it will improve the information for individual sites and provide a stronger case for their conservation. It is hoped that an annual summary of data from the Republic of Ireland will be presented in this report to allow comparison with, and context to, the information collected by WeBS.

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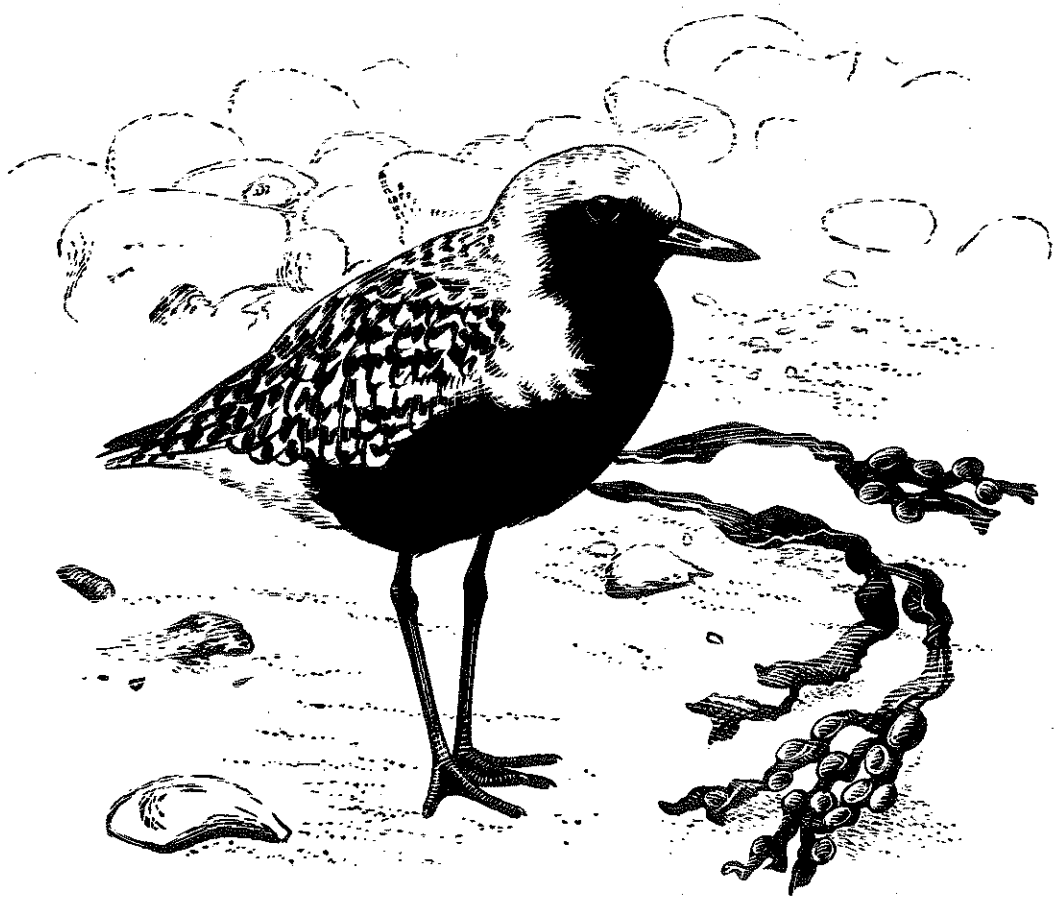

GLOSSARY

The terms listed below are generally restricted to those that have been adopted specifically for use within WeBS or more widely for monitoring.

Autumn
For waders, autumn comprises July to October inclusive. Due to differences in seasonality between species (see *Monthly Fluctuations*), a strict definition of autumn is not used for wildfowl.

British Trust for Ornithology (BTO)
The BTO is a well respected organisation, combining the skills of professional scientists and volunteer birdwatchers to carry out research on birds in all habitats and throughout the year. Data collected by the various surveys form the basis of extensive and unique databases which enable the BTO to objectively advise conservation bodies, government agencies, planners and scientists on a diverse range of issues involving birds.

Complex site
A *WeBS* site that consists of two or more *sectors*.

Core Counts
The basic WeBS counts that monitor all wetlands throughout the UK once per month on priority dates. Used to determine population estimates and trends and identify important sites.

Incomplete counts
When presenting counts of an individual species, a large proportion of the number of birds was suspected to have been missed, e.g. due to part coverage of the site or poor counting conditions, or when presenting the total number of birds of all species on the site, a significant proportion of the total number was missed.

I-WeBS
An independent but complementary scheme operating in the Republic of Ireland to monitor non-breeding waterfowl, organised by the Irish Wildbird Conservancy, the National Parks and Wildlife Service (Ireland) and The Wildfowl & Wetlands Trust.

Joint Nature Conservation Committee (JNCC)
JNCC is the statutory body constituted by the Environmental Protection Act 1990 to be responsible for research and advice on nature conservation at both UK and international levels. The committee is established by English Nature, Scottish Natural Heritage and the Countryside Council for Wales, together with independent members and representatives from the Countryside Commission and Northern Ireland, and is supported by specialist staff.

Local Organiser
Person responsible for co-ordinating counters and counts at a local level, normally a county or large estuary, and the usual point of contact with WeBS partner HQs.

Low Tide Counts (LTC)
WeBS counts made at low tide to assess the relative importance of different parts of individual estuaries as feeding areas for intertidal waterfowl.

Royal Society for the Protection of Birds (RSPB)
The RSPB is the charity that takes action for wild birds and the environment in the UK. The RSPB is the national BirdLife partner in the UK.

Spring
For waders, spring comprises April to June inclusive. Due to differences in seasonality between species (see *Monthly Fluctuations*), a strict definition of spring is not used for wildfowl.

Waterfowl
WeBS follows the definition adopted by IWRB. This includes a large number of families, those occurring in the UK being divers, grebes, cormorants, herons, storks, ibises and spoonbills, wildfowl, cranes, rails, waders and gulls and terns. Note that, due to differences in coverage, not all families may be included in the 'waterfowl totals' given in this report, although the species excluded and the reasons for this will be given in each case.

WeBS count sector
The unit of division of large *sites* into areas which can be counted by one person in a reasonable time period. They are often demarcated by geographic features to facilitate recognition of the boundary by counters. The finest level at which data are recorded.

WeBS count site
A biologically meaningful area that represents a discrete area used by waterfowl such that birds regularly move within but only occasionally between sites. The highest level at which count data are stored.

WeBS count sub-site
A grouping of *sectors* within a *site* to facilitate co-ordination. In most cases, sub-sites also relate to biologically meaningful units for describing waterfowl distribution.

WeBS count unit
The area/boundary within which a count is made. The generic term for *sites*, *sub-sites* and *sectors*.

Wetland Advisory Service (WAS)
The environmental consultancy wing of The Wildfowl & Wetlands Trust.

The Wildfowl & Wetlands Trust (WWT)
Founded by Sir Peter Scott in 1946, WWT is the only wildlife conservation charity specialising in wetlands and the wildlife they support. It has pioneered the bringing together of people and wildlife for the benefit of both and seeks to raise awareness of the value of wetlands, the threats they face and the actions needed to save them. To this end, WWT has eight centres throughout the UK and is dedicated to saving wetlands for wildlife and people.

Winter
For waders, winter comprises November to March inclusive. Due to differences in seasonality between species (see *Monthly Fluctuations*), a strict definition of winter is not used for wildfowl.

Winter (five-year) peak mean
Calculated by averaging the peak count in each season for a particular species at an individual site (i.e. the right hand column of figures in the table in each species account). Normally calculated using the most recent five years' data, this figure is compared with the respective *1% thresholds* to determine if the site qualifies as nationally or internationally important.

1% criterion
The Ramsar Convention has established site selection criteria. One such criterion (currently numbered Criterion 3c) indicates that a site is identified as being of international importance if it holds 1% or more of a population of waterfowl A change in the 1% criterion would be if the selection threshold changes to, say, 2% of a population (the 2% criterion) or 0.5% of a population (0.5% criterion). The term thus relates to the proportion (1%) that is used as a criterion for internationally important site selection.

1% threshold
This logically derives from the *1% criterion* and relates to the number of birds that are used as the nominal 1% of the population for the purposes of site selection. Thus, an international population of 75,215 Shelduck has a derived 1% threshold (adopting rounding conventions) of 750.

Appendix 1. INTERNATIONAL AND NATIONAL IMPORTANCE

Site designations

Criteria for assessing the international importance of wetlands have been agreed by the Contracting Parties to the Ramsar Convention on Wetlands of International Importance (Ramsar Convention Bureau 1988). Under one criterion, a wetland is considered internationally important if it regularly holds at least 1% of the individuals in a population of one species or subspecies of waterfowl, while any site regularly holding a total of 20,000 or more waterfowl also qualifies. Britain and Ireland's wildfowl belong to the north-west European population (Pirot *et al.* 1989), and the waders to the east Atlantic flyway population (Smit & Piersma 1989). A wetland in Britain is considered nationally important if it regularly holds 1% or more of the estimated British population of one species or subspecies of waterfowl, and in Northern Ireland important in an all-Ireland context if it holds 1% or more of the estimated all-Ireland population (see Table 85).

Between *Wildfowl and Wader Counts 1992-93* and 1 January 1995, a further 12 Ramsar sites and 22 SPAs have been designated in the UK, some sites receiving dual designation.

Ramsar designation only
Thursley & Ockley Bogs (Hampshire/Surrey) Midland Meres and Mosses (Cheshire/Shropshire/Staffordshire)

SPA classification only
Thursley, Hankley and Frensham (Wealdon Heaths Phase 1) (Hampshire/Surrey) Hermaness & Saxa Vord (Shetland) Fetlar (Shetland) Copinsay (Orkney) Sule Skerry & Sule Stack (Orkney) Treshnish Isles (Strathclyde) Monach Isles (Western Isles) Loch Vaa (Highland) Glen Tanar (Grampian) Marwick Head (Orkney) Fair Isle (Shetland) Mingulay & Berneray (Western Isles)

SPA and Ramsar designation
Benfleet & Southend (Essex) Cameron Reservoir (Fife) Dengie (Mid-Essex Coast Phase 1) (Essex) Loch of Kinnordy (Tayside) Stour and Orwell (Suffolk/Essex) Thanet Coast & Sandwich Bay (Kent) Humber Flats & Marshes (North Yorkshire/Humberside) Colne Estuary (Mid-Essex Coast Phase 2) (Essex) Loch Maree (Highland) Broadland (Norfolk)

By 1 January 1995, a total of 81 Ramsar sites and 99 SPAs had been designated in the UK, with a further two UK Ramsar sites in Dependent Territories.

(R) = Ramsar site only; (S) = SPA only; the remainder have dual designation.

Abberton Reservoir
Abernethy Forest (S)
Ailsa Craig (S)
Alt Estuary
Benfleet & Southend
Bowland Fells (S)
Bridgend Flats
Bridgwater Bay (R)
Broadland
Bure Marshes (R)
Burry Inlet
Cairngorm Lochs (R)
Cameron Reservoir
Chesil Beach/Fleet
Chew Valley Lake (S)
Chichester/Langstone Harbours
Chippenham Fen (R)
Claish Moss (R)
Colne Estuary
(Mid-Essex Coast Phase 2)
Copinsay (S)
Coquet Island (S)
Cors Fochno/Dyfi (R)
Cors Caron (R)
Crymlyn Bog (R)
Dee Estuary
Dengie
(Mid-Essex Coast Phase 1)
Derwent Ings
Eilean na Muice Duibhe
(Duich Moss)
Esthwaite Water (R)
Exe Estuary
Fair Isle (S)
Fala Flow
Farne Islands (S)
Fetlar (S)
Feur Lochain
Flamborough Head
& Bempton Cliffs (S)
Flannan Isles (S)
Forth Islands (S)
Fowlsheugh (S)
Gibraltar Point/The Wash
(Phase 2)
Glac-na-Criche
Gladhouse Reservoir
Glannau Aberdaron (S)
Glannau Ynys Gybi (S)
Glen Tanar (S)
Grassholm (S)
Great Yarmouth
North Denes (S)
Gruinart Flats
Hamford Water
Handa Island (S)
Hermaness & Saxa Vord (S)
Hickling Broad/
Horsey Mere (R)
Holburn Lake and Moss
Hornsea Mere (S)
Hoselaw Loch
Humber Flats & Marshes
Irtinghead Mires (R)
Laggan Peninsula (S)
Leighton Moss
Lindisfarne
Llyn Tegid (R)
Llyn Idwal (R)
Loch Leven (R)
Loch Ken/Dee Marshes
Loch Eye
Loch An Duin (R)
Loch Lomond (R)
Loch of Lintrathen
Loch Vaa (S)
Loch Spynie
Loch Maree
Loch of Skene
Loch of Kinnordy
Lochs
Druidibeg/a'Machair/Stillgary
Loughs Neagh/Beg (R)
Lower Derwent Valley
Malham Tarn (R)
Martin Mere
Marwick Head (S)
Medway Estuary and Marshes
Midland Meres and Mosses (R)
Mingulay & Berneray (S)
Minsmere/Walberswick
Monach Isles (S)
Moor House (S)
Nene Washes
North Norfolk Coast
Old Hall Marshes
Orfordness/Havergate (S)
Ouse Washes
Pagham Harbour
Porton Down (S)

Priest Island (S)
Rannoch Moor (R)
Redgrave and South Lopham Fens (R)
Rhum (S)
Ribble Estuary (part) (S)
Rockcliffe Marshes
Rostherne Mere (R)
Roydon Common (R)
Rutland Water
Salisbury Plain (S)
Sheep Island (S)
Shiant Isles (S)
Silver Flowe (R)
Skokholm and Skomer Islands (S)
South Tayside Goose Roosts
St Kilda (S)
Stodmarsh
Stour and Orwell
Sule Skerry & Sule Stack (S)
Swan Island (S)
Thanet Coast & Sandwich Bay
The New Forest
The Wash
The Swale
Thursley, Hankley and Frensham (S)
Thursley & Ockley Bogs (R) (the above two sites overlap)
Traeth Lafan (S)
Treshnish Isles (S)
Upper Solway
Upper Severn Estuary
Walmore Common
Ynys Feurig (S)

1% levels for national and international importance

A wetland is considered important in a national or all-Ireland context if it regularly holds at least 1% of one species, sub-species or population of waterfowl in Great Britain or the island of Ireland respectively. Similarly, a wetland is of international importance if it supports 1% or more of the international population. Many wildfowl wintering in Britain and Ireland form part of the North-West European population, whilst many waders form part of populations that may range over much of the East Atlantic. Table 85 lists the numbers of each species that represent 1% of the British, all-Ireland and international waterfowl populations where known. Thus, any site regularly supporting at least this number of birds potentially qualifies for designation under national legislation or international Directives or Conventions. The international population for each species and sub-species is also specified in the table. However, it should be noted that, where 1% of the national population is less than 50 birds, 50 is normally used as a minimum qualifying level for the designation of sites of national importance. 1% levels have not been derived for introduced species since these species are not covered by the relevant parts of the legislation and important sites (e.g. SSSIs) would not be identified on the basis of numbers of these birds. Sources of qualifying levels represent the most up-to-date figures following recent reviews: for British wildfowl see Kirby (1995); for British waders see Cayford & Waters (in press); for all-Ireland importance for divers see Danielsen *et al.* (1993) and for other waterfowl see Whilde (in prep.) cited in Way *et al.* (1993). Following a recent workshop in Denmark on international populations, international criteria follow Smit & Piersma (1989) or Rose & Scott (1994). It was agreed at a recent meeting in Denmark that population estimates will be reviewed every three years and 1% thresholds revised every nine years (Rose & Stroud 1994) (see Conservation and Management)

Table 85. 1% LEVELS FOR NATIONAL AND INTERNATIONAL IMPORTANCE

	Great Britain	all-Ireland	International	Population
Red-throated Diver	50	10 *	750	Europe/Greenland
Black-throated Diver	7 *	1 *	1,200	Europe/W Siberia
Great Northern Diver	30 *	?	50	Europe
Little Grebe	30 *	?	?	W Palaearctic
Great Crested Grebe	100	30 *	?	NW Europe
Red-necked Grebe	1 *	?	330	NW Europe
Slavonian Grebe	4 *	?	50	NW Europe
Black-necked Grebe	1 *	?	1,000	W Palaearctic
Cormorant	130	?	1,200	NW Europe
Little Egret	?	?	800	W Mediterranean
Grey Heron	?	?	4,500	Europe/N Africa
Mute Swan	260	55	1,800	NW Europe
Bewick's Swan	70	25 *	170	Europe (wintering)
Whooper Swan	55	100	170	Iceland
Bean Goose	4 *	+ *	800	W Tundra
Pink-footed Goose: Iceland/Greenland	1,900	+ *	1,900	Iceland/Greenland
European White-fronted Goose	60	+ *	4,500	NW Europe
Greenland White-fronted Goose	140	140	260	Greenland
Greylag Goose: Iceland	1,000	40 *	1,000	Iceland
Hebrides/N Scotland	50	n/a	50	Scotland
Barnacle Goose: Greenland	270	75	320	Greenland
Svalbard	120	+ *	120	Svalbard
Dark-bellied Brent Goose	1,000	+ *	2,500	Siberia
Light-bellied Brent Goose: Canada/Greenland	+ *	200	200	Canada/Greenland
Svalbard	25 *	+ *	40	Svalbard
Shelduck	750	70	2,500	NW Europe
Wigeon	2,800	1,250	7,500	NW Europe
Gadwall	80	+ *	250	NW Europe
Teal	1,400	650	4,000	NW Europe
Mallard	5,000	500	20,000 **	NW Europe
Pintail	280	60	700	NW Europe
Garganey	+ *	+ *	20,000 **	W Africa (wintering)
Shoveler	100	65	400	NW Europe
Red-crested Pochard	+ *	+ *	200	SW/Central Europe
Pochard	440	400	3,500	NW Europe

Tufted Duck	600	400	7,500	NW Europe
Scaup	110	30 *	3,100	NW Europe
Eider	750	20 *	20,000 **	Europe
Long-tailed Duck	230	+ *	20,000 **	Iceland/Greenland
Common Scoter	230	40 *	8,000	NW Europe
Velvet Scoter	30 *	+ *	2,500	NW Europe
Goldeneye	170	110	3,000	NW Europe
Smew	2 *	+ *	150	NW Europe
Red-breasted Merganser	100	20 *	1,000	NW Europe
Goosander	90	+ *	1,500	NW Europe
Coot	1,100	250	15,000	NW Europe
Oystercatcher	3,600	500	9,000	Europe/W Africa (wintering)
Avocet	10 *	+ *	700	Europe/NW Africa (breeding)
Little Ringed Plover	?	?	?	Europe/W Africa
Ringed Plover	290	125	500	Europe/NW Africa (wintering)
passage	300			
Golden Plover	2,500	2,000	18,000	NW Europe (breeding)
Grey Plover	430	40 *	1,500	E Atlantic
Lapwing	20,000 **	2,500	20,000 **	Europe/W Africa
Knot *C. c. islandica*	2,900	375	3,500	W Europe/Canada
C. c. canutus			5,000	W Africa/W Siberia
Sanderling	230	35 *	1,000	E Atlantic
passage	300			
Little Stint	?	?	2,100	W Africa/Europe
Curlew Sandpiper	?	?	4,500	W Africa/SW Europe (wintering)
Purple Sandpiper	210	10 *	500	E Atlantic
Dunlin *C. a. arctica*			150	Greenland (breeding)
C. a. schinzii (Icelandic)			8,000	Iceland/Greenland (breeding)
C. a. schinzii (temperate)			200	UK/Ireland/Baltic
C. a. alpina	5,300	1,250	14,000	Europe (breeding)
passage	2,000			
Ruff	7 *	+ *	10,000	W Africa (wintering)
Jack Snipe	?	250	?	Europe/W Africa (wintering)
Snipe	?	?	10,000	Europe/W Africa (breeding)
Woodcock	?	?	20,000 **	Africa/Europe
Black-tailed Godwit	70	90	700	Iceland (breeding)
Bar-tailed Godwit	530	175	1,000	W Europe (wintering)
Whimbrel	+ *	+ *	6,500	Europe/W Africa (wintering)
passage	50			
Curlew	1,200	875	3,500	Europe/NW Africa
Spotted Redshank	+ *	+ *	1,500	Europe/W Africa
Redshank *T. t. totanus*	1,100	245	1,500	Europe/W Africa (wintering)
T. t. robusta	1,100		1,500	NW Europe (wintering)
passage	1,200			
Greenshank	+ *	9 *	3,000	Europe/W Africa
Green Sandpiper	?	?	?	Europe (breeding)
Common Sandpiper	?	?	?	Europe (breeding)
Turnstone	640	225	700	Europe (wintering)
Little Gull	?	?	750	Cent/E Europe (breeding)
Black-headed Gull	?	?	20,000 **	NW Europe
Common Gull	?	?	16,000	NW Europe
Lesser Black-backed Gull	?	?	4,500	W Europe
Herring Gull	?	?	13,000	W Europe/Iceland
Great Black-backed Gull	?	?	4,800	W Atlantic
Kittiwake	?	?	20,000 **	E Atlantic
Sandwich Tern	?	?	1,500	W Europe/W Africa
Common Tern	?	?	6,000	N/E Europe
Little Tern	?	?	340	E Atlantic
Black Tern	?	?	2,000	Europe/Asia

? *Population size not accurately known*

\+ *Population too small for meaningful figure to be obtained*

* *Where 1% of the British or all-Ireland wintering population is less than 50 birds, 50 is normally used as a minimum qualifying level for national or all-Ireland importance respectively*

** *A site regularly holding more than 20,000 waterfowl qualifies as internationally important by virtue of absolute numbers*

Appendix 2. LOCATIONS OF WeBS COUNT SITES

The location of all count sites or areas mentioned in this report are given here. Sites are listed alphabetically for the UK and Northern Ireland separately, with the 1 km square OS grid reference for the centre of the site, and the county or district. Note that this is not an exhaustive list of WeBS sites counted in 1993-94, simply those mentioned by name in this report. Figure 2 shows the location of many of the more important sites for waterfowl.

UNITED KINGDOM

Site	1 km square	County
Abberton Reservoir	NT4581	Essex
Adur Estuary	TQ2006	West Sussex
Afan Estuary	SS7488	West Glamorgan
Alaw Reservoir	SH3968	Gwynedd
Alde Complex	TM4257	Suffolk
Aldwarke Toll	SK4494	South Yorkshire
Alt Estuary	SD2903	Merseyside
Amwell Gravel Pits	TL3713	Hertfordshire
Ardleigh Reservoir	TM0328	Essex
Ardsley Reservoir	SE2924	West Yorkshire
Artro Estuary	SH5727	Gwynedd
Ashford Common Waterworks	TQ0869	Surrey
Ash Levels	TR3162	Kent
Aqualate Mere	SJ7720	Staffordshire
Attenborough Gravel Pits	SK5234	Nottinghamshire
Auchencairn Bay	NX8252	Dumfries & Galloway
Avon Estuary	SX6745	Devon
Avon Valley (Lower)	SZ1499	Hampshire
Avon Valley (Mid)	SU1510	Hampshire
Axe Estuary	SY2590	Devon
Ayr Harbour to Greenan Castle	NS3322	Strathclyde
Ayr to Prestwick	NS3324	Strathclyde
Ballo Reservoir	NO2205	Fife
Ballysaggart Lough	H7961	Tyrone
Bann Estuary	C7935	Londonderry
Barn Elms Reservoir	TQ2277	Greater London
Barr Loch	NS3557	Strathclyde
Baston/Langtoft Gravel Pits	TF1212	Lincolnshire
Beaulieu Estuary	SZ4298	Hampshire
Belfast Lough	J4083	Down
Belvide Reservoir	SJ8610	Staffordshire
Bemersyde Moss	NT6133	Borders
Bewl Water	TQ6733	Sussex
Biggar Water	NT1036	Borders
Black Cart Water	NS4767	Borders
Blackwater Estuary	TL9307	Essex
Blagdon Lake	ST5150	Avon
Blatherwyke Lake	SP9796	Northamptonshire
Blenheim Park Lake	SP4316	Oxfordshire
Blickling Lake	TG1729	Norfolk
Blithfield Reservoir	SK0524	Staffordshire
Blunham Gravel Pit	TL1551	Bedfordshire
Blyth to Newbiggin	NZ3084	Northumberland
Blyth Estuary (Suffolk)	TM4675	Suffolk
Blyth Estuary (Northumberland)	NZ3082	Northumberland
Boghill Fields	C8734	Londonderry
Bolton-on-Swale Gravel Pits	SE2498	North Yorkshire
Bough Beech Reservoir	TQ4947	Kent
Bourton-on-the-Water Gravel Pits	SP1720	Gloucestershire
Brading Harbour	SZ6388	Isle of Wight
Braint Estuary	SH4463	Gwynedd
Breydon Water	TG4907	Norfolk
Broad Bay	NB4733	Western Isles
Broad Water Canal	J1462	Antrim
Buckden/Stirtloe Gravel Pits	TL2066	Cambridgeshire
Buckenham Marshes	TG3505	Norfolk
Bucklands Pond	ST4769	Avon
Burghfield Gravel Pits	SU6870	Berkshire
Burry Inlet	SS5096	West Glamorgan, Dyfed
Burshill Ponds	TA0947	Humberside
Busbridge Lakes	SU9742	Surrey
Bute	NS0761	Strathclyde
Caithness Lochs	ND1859	Highland
Camel Estuary	SW9474	Cornwall
Cameron Reservoir	NO4711	Fife
Canary Road	H8755	Armagh
Cannop Ponds	SO6010	Gloucestershire
Cardigan Bay	SH5020	Gwynedd, Dyfed
Carlhurlie Bay	NO3904	Fife
Carlingford Lough	J2013	Down
Carmarthen Bay	SN2501	Dyfed
Carron Valley Reservoir	NS6884	Central
Carsebreck/Rhynd Lochs	NN8609	Tayside
Castle Howard Lake	SE7170	North Yorkshire
Castle Loch, Lochmaben	NY0881	Dumfries & Galloway
Cefni Estuary	SH4067	Anglesey
Cemlyn Bay	SH3393	Gwynedd
Chasewater	SK0307	West Midlands
Cheddar Reservoir	ST4454	Somerset
Chelsea Reservoirs	TQ1168	Surrey
Cheshunt Gravel Pits	TL3602	Hertfordshire
Chew Valley Lake	ST5659	Avon
Chichester Gravel Pits	SU8703	West Sussex
Chichester Harbour	SU7700	West Sussex
Chorlton Water Park	SJ8291	Greater Manchester
Christchurch Harbour	SZ1792	Dorset
Church Wilne Reservoir	SK4632	Derbyshire
Cleddau Estuary	SN0005	Dyfed
Clifford Hill Gravel Pits	SP8061	Northamptonshire
Clumber Park Lake	SK6374	Nottinghamshire
Clwyd Estuary	SJ0079	Clwyd
Coate Water	SU1782	Wiltshire
Cobbinshaw Reservoir	NT0158	Lothian
Colemans Reservoir	TL8414	Essex
Coll	NM2055	Strathclyde
Colliford Reservoir	SX1871	Cornwall
Colne Estuary	TM0614	Essex
Colonsay/Oronsay	NR3896	Strathclyde
Colwick Country Park	SK6039	Nottinghamshire
Colwyn Bay	SH9079	Clwyd
Conwy Estuary	SH7877	Gwynedd
Coombe Hill Canal	SO8626	Gloucestershire
Coquet Estuary	NU2706	Northumberland
Corbet Loch	J1844	Down
Corby Loch	NJ9214	Grampian
Cotswold Water Park East	SU1999	Gloucestershire,
Cotswold Water Park West	SU0595	Gloucestershire,
Cowgill Reservoirs	NT0327	Strathclyde
Cresswell Pond	NZ2894	Northumberland
Cromarty Firth	NH7771	Highland
Crombie Loch	NO5240	Tayside
Crouch/Roach Estuary	TQ8496	Essex
Croxall Gravel Pits	SK1914	Staffordshire
Cuckmere Estuary	TV5197	East Sussex
Cults Reservoir	NJ9002	Grampian
Cuttmill Ponds	SU9145	Surrey
Danna/Keills Peninsula	NR7383	Strathclyde
Dart Estuary	SX8258	Devon
Deben Estuary	TM2942	Suffolk
Dee Estuary (England/Wales)	SJ2675	Merseyside, Cheshire, Clwyd
Dee Estuary (Scotland)	NJ9505	Grampian
Deeping St James Gravel Pits	TF1808	Lincolnshire
Dengie Estuary	TM0300	Essex
Deveron Estuary	NJ6964	Grampian
Dinnet Lochs	NJ4800	Grampian
Dinton Pastures	SU7872	Berkshire
Dipple	NS2002	Strathclyde
Doddington Pool	SJ7146	Cheshire
Don Estuary	NJ9509	Grampian
Don Mouth to Blackdog	NJ9611	Grampian
Doon Estuary	NS3219	Strathclyde
Dorchester Gravel Pits	SU5795	Oxfordshire
Dornoch Firth	NH7384	Highland
Drakelow Gravel Pit	SK2320	Derbyshire
Draycote Water	SP4469	Warwickshire
Drift Reservoir	SW4328	Cornwall
Drumgay Lough	H2448	Fermanagh
Drumore Loch	NO1660	Tayside
Drummond Pond	NN8518	Tayside
Druridge Pool	NZ2796	Northumberland
Duddon Estuary	SD2081	Cumbria
Dulas Bay	Sh4888	Gwynedd
Dundrum Bay	J4235	Down
Dungeness Gravel Pits	TR0619	Kent
Duns Dish	NO6460	Tayside
Dupplin Loch	NO0320	Tayside
Durham Coast	NZ4349	Durham
Durleigh Reservoir	ST2636	Somerset
Dyfi Estuary	SN6394	Dyfed
Dysynni Estuary	SH5702	Gwynedd
Earls Barton Gravel Pits	SP8966	Northamptonshire
East Fortune Ponds	NT5580	Lothian
Eastersound/Uyeasound	HP5901	Shetland
Eccup Reservoir	SE2941	West Yorkshire
Eden Valley	NY4559	Cumbria
Eden Estuary	NO4719	Fife
Ellesmere	SJ4035	Shropshire
Erme Estuary	SX6249	Devon
Esthwaite Water	SD3596	Cumbria
Etherow Country Park	SJ9791	Greater Manchester
Eversley Cross & Yateley Gravel Pits	SU8601	Hampshire

Site	1 km square	County
Exe Estuary	SX9883	Devon
Eyebrook Reservoir	SP8595	Leicestershire
Fairburn Ings	SE4627	North Yorkshire
Fala Flow	NT4258	Lothian
Fal Complex	SW8541	Cornwall
Farmoor Reservoirs	SP4406	Oxfordshire
Farmwood Pool	SJ8173	Cheshire
Fedderate Reservoir	NJ8652	Grampian
Fen Drayton Gravel Pits	TL3470	Cambridgeshire
Fiddlers Ferry Lagoons	SJ5585	Cheshire
Fleet Bay	NX5652	Dumfries & Galloway
Fleet Pond	SU8255	Hampshire
Fleet/Wey	SY6976	Dorset
Fonthill Lake	ST9331	Wiltshire
Foreland	SZ6587	Isle of Wight
Forth Estuary	NT2080	Lothians, Central, Fife
Foryd Bay	SH4559	Gwynedd
Fowey Estuary	SX1254	Cornwall
Foxcote Reservoir	SP7136	Buckinghamshire
Frenchess Pond	TO2851	Surrey
Frimley Gravel Pits	SU8757	Surrey
Gadloch	NS6471	Borders
Gannel Estuary	SW8060	Cornwall
Gladhouse Reservoir	NT2953	Lothian
Glaslyn Marshes	SH6041	Gwynedd
Glenfarg Reservoir	NO1011	Tayside
Grafham Water	TL1568	Cambridgeshire
Great Linford Gravel Pits	SP8442	Buckinghamshire
Great Pool, Westwood Park	SO8763	Hereford & Worcester
Guernsey Shore	WV27	Channel Islands
Gunton Parks	TG2234	Norfolk
Haddo House Lakes	NJ8734	Grampain
Hamford Water	TM2225	Essex
Hamilton Low Parks	NS7257	Strathclyde
Hammer Pond	TQ2229	West Sussex
Hanningfeild Reservoir	TQ7398	Essex
Hardley Flood	TM3899	Norfolk
Hauxley Haven	NU2802	Northumberland
Hay-a-Park Gravel Pits	SE3658	North Yorkshire
Hayle Estuary	SW5537	Cornwall
Heaton Park Reservoir	SD8205	Greater Manchester
Heigham Holmes	TG4420	Norfolk
Helford Estuary	SW7526	Cornwall
Hilfield Park Reservoir	TQ1596	Hertfordshire
Hickling Broad	TG4121	Norfolk
Hirsel Lake	NT8240	Borders
Hogganfield Loch	NS6467	Strathclyde
Holburn Moss	NU0536	Northumberland
Holden Wood Reservoir	Sd7722	Lancashire
Hollowell Reservoir	SP6872	Northamptonshire
Holme Pierrepont Gravel Pits	SK6239	Nottinghamshire
Hoselaw Loch	NT8031	Borders
Hule Moss	NT7149	Borders
Humber Estuary	TA2020	Humberside, Lincolnshire
Hunterston Estuary	NS1848	Strathclyde
Hurworth Burn Reservoir	NZ4033	Durham
Inland Sea	SH2779	Gwynedd
Inner Clyde Estuary	NS3576	Strathclyde
Inner Moray Firth	NH6752	Highland
Irt/Mite/Esk Estuary	SD0796	Cumbria
Irvine Estuary	NS3038	Strathclyde
Irvine to Saltcoats	NS2839	Strathclyde
Islay	NR3560	Strathclyde
Islesteps (Cargen Water)	NX9772	Dumfries & Galloway
Jersey Shore	WV6249	Channel Islands
Kedleston Park Lake	SK3141	Derbyshire
Kenwith Nature Reserve	SS4427	Cornwall
Kilconquhar Loch	NO4801	Fife
King George V Reservoir	TQ3796	Greater London
Kingsbridge Estuary	SX7411	Devon
Kings Bromley Gravel Pits	SK1116	Staffordshire
Kingsbury Water Park & Coton Pools	SP2096	Warwickshire
Kingscross, Arran	NS0526	Strathclyde
Kings Mill Reservoir	SK5159	Nottinghamshire
Kirkcudbright Bay	NX6849	Dumfries & Galloway
Knight & Bessborough Reservoirs	TQ1268	Surrey
Lackford Gravel Pits	TL7971	Suffolk
Lade Sands	TR0921	Kent
Lake of Menteith	NN5700	Central
Lambeth Reservoirs	TQ1268	Surrey
Lancaster Canal	SD4766	Lancashire
Langstone Harbour	SU6902	Hampshire
Larne Lough	D4200	Antrim
Lavan Sands	SH6474	Gwynedd
Leighton & Roundhill Reservoirs	SE1678	North Yorkshire
Leighton Moss	SD4875	Lancashire
Lindisfarne	NU1041	Northumberland
Linne Mhuirich & Loch Na Cille	NR7080	Strathclyde
Little Paxton Gravel Pits	TL1963	Cambridgeshire
Little Stour Valley	TR2056	Kent
Llangorse Lake	SO1326	Powys
Llyn Bran	SH9659	Clwyd
Llyn Maelog	SH3272	Gwynedd
Llyn Penrhyn	SH3077	Gwynedd
Llyn Traffwll	SH3276	Gwynedd
Loch An Tiumpan/Loch An Duin	NB5637	Western Isles
Loch Bee	NF7743	Western Isles
Loch Branahuie	NB4732	Western Isles
Loch Eye	NH8379	Highland
Loch Fleet Complex	NH7896	Highland
Loch Garten	NH9718	Highland
Loch Gilp	NR8686	Strathclyde
Loch Gruinart	NR2971	Strathclyde
Loch Heilen	ND2568	Highland
Loch Indaal	NR3261	Strathclyde
Loch Ken	NX6870	Dumfries & Galloway
Loch Leven	NO1401	Tayside
Loch Linnhe: Camas Shallachain	NM9862	Highland
Loch Lomond: Endrick Mouth	NS4388	Strathclyde
Loch Mullion	NN9833	Tayside
Loch Na Bo	NJ2860	Grampian
Loch Na Keal	NM5038	Strathclyde
Loch of Boardhouse	HY2725	Orkney
Loch of Clumly	HY2516	Orkney
Loch of Harray	HY2915	Orkney
Loch of Kinnordy	NO3655	Tayside
Loch of Lintrathen	NO2754	Tayside
Loch of Loirston	NJ9401	Grampian
Loch Mahaick	NN7006	Central
Loch of Sabiston	HY2922	Orkney
Loch of Skene	NJ7807	Grampian
Loch of Spiggie	HU3716	Shetland
Loch of Stenness	NY2812	Orkney
Loch of Strathbeg	NK0758	Grampian
Loch of the Lowes	NO0443	Perthshire
Loch Ore	NT1695	Fife
Loch Ryan	NX0565	Dumfries & Galloway
Lochs Beg & Scridain	NM5027	Strathclyde
Loch Spynie	HU3716	Shetland
Loch Tullybelton	NO0034	Tayside
Loch Watten	ND2256	Highland
Loe Pool	SW6424	Cornwall
Long Loch	NS4752	Strathclyde
Longueville Marsh	WV6748	Channel Islands
Looe Estuary	SX2553	Cornwall
Lossie Estuary	NJ2470	Grampian
Lossiemouth Beach	NJ2470	Grampian
Lothing Lake & Oulton Broad	TM5292	Suffolk
Lough Foyle	C6025	Londonderry
Lough Money	J5345	Down
Loughs Neagh & Beg	J0575	Down, Antrim, Armagh, Londonderry, Tyrone
Lower Bogrotten	NJ4861	Grampian
Lower Derwent Valley	SE6938	Humberside
Lower Windrush Valley	SP4004	Oxfordshire
Luce Bay	NX1855	Dumfries & Galloway
Machrihanish	NR6522	Strathclyde
Machrie Bay, Arran	NR8933	Strathclyde
Maidens Harbour/Turnberry	NS2108	Strathclyde
Marlee Loch	NO1440	Perthshire
Marsh Lane Gravel Pits	TL3069	Cambridgeshire
Martin Mere	SD4105	Lancashire
Mawddach Estuary	SH6416	Gwynedd
Medina Estuary	SZ5093	Isle of Wight
Medway Estuary	TQ8471	Kent
Mepal Gravel Pits	TL4283	Cambridgeshire
Mere Sands Wood	SD4415	Lancashire
Merryton Ponds	NS7654	Strathclyde
Mersey Estuary	SJ4578	Cheshire
Middle Yare Marshes	TG3504	Norfolk
Minsmere	TM4666	Suffolk
Montrose Basin	NO6958	Tayside
Moray Coast	NJ3067	Grampian
Moray Firth	NH8060	Highland
Morecambe Bay	SD4070	Lancashire, Cumbria
Nene Washes	TF3300	Cambridgeshire
Netherfield Gravel Pit	SK6399	Nottinghamshire
Neumanns Flash	SJ6575	Cheshire
Newbiggin to Blyth	NZ3084	Northumberland
Newhaven Estuary	TQ4400	East Sussex
New Road Gravel Pits	TI1549	Bedfordshire
Newtown Estuary	SZ4291	Isle of Wight
North Norfolk Marshes	TF8546	Norfolk
North Warren	TM4658	Suffolk
North West Solent	SZ3395	Hampshire
Nunnery Lakes	TL8781	Norfolk
Nyfer Estuary	SN0539	Dyfed
Ogmore Estuary	SS8675	Mid Glamorgan
Orkney	HY4010	Orkney
Ormesby Broads	TG4614	Norfolk
Otter Estuary	SY0872	Cornwall
Ouse/Lairo Water (Shapinsay)	HY5019	Orkney
Outer Ards	J6663	Down
Orwell Estuary	TM2238	Suffolk
Ouse Washes	TL5394	Cambridgeshire
Pagham Harbour	SZ8796	West Sussex
Pannel Valley	TQ8815	East Sussex
Pegwell Bay	TR3563	Kent

Site	1 km square	County
Pen Ponds	TQ1972	Greater London
Pentney Gravel Pits	TF7013	Norfolk
Pitsford Reservoir	SP7669	Northamptonshire
Plym Estuary	SX5055	Devon
Poole Harbour	SY9988	Dorset
Portavo Lake	J5582	Down
Port Meadow	SP4908	Oxfordshire
Portsmouth Harbour	SU6204	Hampshire
Pow Burn to Barassie	NS3130	Strathclyde
Pulborough Levels	TQ0416	West Sussex
Queen Elizabeth II Reservoir	TQ1167	Surrey
Queen Mary Reservoir	TQ0769	Surrey
Queens Park, Swindon	Su1584	Wiltshire
Ranworth & Cockshoot Broads	TG2515	Norfolk
Ravensthorpe Reservoir	SP6770	Northamptonshire
Red Wharf Bay	SH4893	Gwynedd
Rhunahaorine	NR7049	Argyll
Ribble Estuary	SD3825	Lancashire
Ringstead Gravel Pits	SP9775	Northamptonshire
River Eden: Rock to Armarthwaite	NY4758	Cumbria
River Idle: Bawtry to Misterton	SK7195	Nottinghamshire
River Lagan: Flatfield	J1961	Down
River Lune: Caton to Hornby/ Wenning Foot	SD5566	Lancashire
River Soar: Leicester	SK5805	Leicestershire
River Spey: Boat of Balliefirth	NH9922	Highland
River Test: Fullerton to Stockbridge	SU3535	Hampshire
River Teviot: Nisbet	NT6725	Borders
River Teviot: Kalemouth to Roxburgh	NT7030	Borders
River Trent: Shardlow to Sawley	SK4530	Derbyshire
River Tweed: Kelso to Coldstream	NT7737	Borders
River Tweed: Rutherford	NT6431	Borders
River Usk: Pencilli	SO0925	Powys
River Wensum: Fakenham to Great Ryburgh	TF9428	Norfolk
Rostherne Mere	SJ7484	Cheshire
Rough Firth	NX8453	Dumfries & Galloway
Rubha Mor to Ullapool River	NH1293	Highland
Rutland Water	SK9207	Leicestershire
Ryde Pier to Puckpool Point	SK6092	Isle of Wight
Rye Harbour/Pett Level	TQ9418	East Sussex
Rye Meads Sewage Farm	TL3810	Hertfordshire
St Benets Levels	TG3815	Norfolk
Saintear Loch	HY4347	Orkney
Sandbach Flashes	SJ7259	Cheshire
Seahouses to Budle Point	NU2231	Northumberland
Seaton Gravel Pits	TR2258	Kent
Sennowe Park Lakes	TF9825	Norfolk
Severn Estuary	ST5058	Avon, Gloucestershire Gwent, Mid Glamorgan
Shell Pond	SJ7591	Greater Manchester
Slains Lochs	NK0230	Grampian
Snettisham	TF6535	Norfolk
Solway Estuary	NY1060	Cumbria
Somerset Levels	ST4040	Somerset
Sound of Tarransay	NG0498	Western Isles
South Alnmouth	NU2510	Northumberland
South Down	J5036	Down
South Ford	NF7744	Western Isles
South Muskham & North Newark Gravel Pits	SK7956	Nottinghamshire
South West Lancashire	SD4015	Lancashire
Southampton Water	SU4507	Hampshire
Spey Estuary	NJ3465	Grampian
Staines Reservoir	TQ0575	Surrey
Stanford Reservoir	SP6080	Leicestershire
Stithians Reservoir	SW7236	Cornwall
Stodmarsh	TR2061	Kent
Stoke Newington Reservoirs	TQ3287	Greater London
Stour Estuary	TM1732	Essex, Suffolk
Stowe Pool	SK1210	Staffordshire
Strangford Lough	J5560	Down
Stranraer Lochs	NX1161	Dumfries & Galloway
Stratfield Saye	SU7061	Hampshire
Studland Bay	SZ0383	Dorset
Summerleaze Gravel Pits	SU8982	Berkshire
Sutton/Lound Gravel Pits	SK6985	Nottinghamshire
Swale Estuary	TQ9765	Kent
Swanbourne Lake	TQ0108	West Sussex
Swanholme Lake	SK9468	Lincolnshire
Swansea Bay	SS6391	West Glamorgan
Swillington Ings	SE3828	West Yorkshire
Swithland Reservoir	SK5513	Leicestershire
Tabley Mere	SJ7276	Cheshire
Tamar Complex	SX4363	Devon, Cornwall
Tansor Gravel Pits	TL0592	Northamptonshire
Tattershall Pits	TF2057	Linconshire
Taw/Torridge Estuary	SS4733	Devon
Tay Estuary	NO3225	Fife, Tayside
Tay/Isla Valley	NO1438	Tayside
Tees Estuary	NZ5528	Cleveland
Teifi Estuary	SN1647	Dyfed
Teign Estuary	SX9272	Devon
Temple Water	J5750	Down
Thames Estuary	TQ7880	Essex, Greater London
Thanet Coast	TR2669	Kent
Theale Gravel Pits	SU6570	Berkshire
Thorpe Water Park	TQ0268	Surrey
Thrapston Gravel Pit	SP9979	Northamptonshire
Thurso Bay	ND1169	Highland
Timsbury Lake	SU3624	Hampshire
Tiree	NL9741	Strathclyde
Tophill Low Reservoirs	TA0748	Humberside
Traeth Bach	SH5736	Gwynedd
Traighear	NF8475	Western Isles
Trent Valley Gravel Pit	SK4629	Leicestershire
Tresco Great Pool	SV8914	Isles of Scilly
Tring Reservoirs	SP9113	Hertfordshire
Tweed Estuary	NT9853	Northumberland
Tyne Estuary	NZ3768	Tyne & Wear
Tyninghame Estuary	NT6379	Lothian
Tyrella	J4735	Down
Upper Lough Erne	H3231	Fermanagh
Upper Quoile	J4745	Down
Upton Warren	SO9367	Hereford & Worcester
Virginia Water	SU9769	Berkshire
Walland Marsh	TQ9824	Kent
Walmore Common	SO7425	Gloucestershire
Walthamstow Reservoir	TQ3589	Greater London
Wantsum Marshes	TR2366	Kent
Ware Gravel Pits	TL3613	Hertfordshire
Wash	TF5540	Lincolnshire, Norfolk
Water Sound	ND4394	Orkney
West Water Reservoir	NT1252	Borders
Westfield Marshes	ND0664	Highland
Wet Sleddale Reservoir	NY5511	Cumbria
Whiteadder Reservoir	NT6563	Lothian
Whitemoor Reservoir	SD8743	Lancashire
Whitton Loch	NT7519	Borders
Whisby Gravel Pits	SK9167	Lincolnshire
Wicksteed Park Lake	SP8846	Northamptonshire
Widewall Bay	ND4292	Orkney
Wigtown Bay	NX4456	Dumfries & Galloway
Willen Balance Lake	SP8741	Buckinghamshire
William Girling Reservoir	TQ3694	Greater London
Willington Gravel Pits	SK2828	Derbyshire
Windermere	SD3995	Cumbria
Witley Park	SU9239	Surrey
Woburn Park Lakes	SP9632	Bedfordshire
Woodsford Water Medows	SY7390	Dorset
Woolston Eyes	SJ6588	Cheshire
Wootton Estuary	SZ5592	Isle of Wight
Worsborough Reservoir	SE3403	Greater Manchester
Wraysbury Gravel Pits	TQ0073	Berkshire
Wraysbury Reservoir	TQ0274	Surrey
Yar Estuary	SZ3588	Isle of Wight
Yealm Estuary	SX5450	Devon
Ythan Estuary	NK0026	Grampian
Ythan to Collieston	NK0226	Grampian

REPUBLIC OF IRELAND

Site	1 km square	County
Ballyhaunis Lakes	M5184	Mayo, Roscommon
Ballymacoda	X0672	Cork
Blackwater Callows	W9998	Waterford, Cork
Boyne Estuary	O1577	Louth, Meath
Cork Harbour	W8065	Cork
Cull & Killag	S9505	Wexford
Dublin Bay	O2235	Dublin
Dundalk Bay	J0602	Louth
Inner Galway Bay	M2022	Galway, Clare
Lee Reservoir	W4070	Cork
Lough Owel	N4058	Westmeath
Lough Ennell	N4045	Westmeath
Lough Swilly	C3025	Donegal
Loughs Kinale & Derragh	N3880	Longford, Cavan
Mid Clare Lakes	R3090	Clare
Rogerstown Estuary	O2252	Dublin
Sligo Bay	G6238	Sligo
Stabbanan Bog	O0193	Louth
Tacumshin Lake	T0506	Wexford
Trawbreaga Bay	C4550	Donegal
Wexford Harbour & Slobs	T0822	Wexford

Appendix 3. TOTAL NUMBERS OF WATERFOWL RECORDED BY WeBS IN ENGLAND DURING 1993-94.

Wildfowl at all sites	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
Number of sites counted	*1,230*	*1,411*	*1,470*	*1,391*	*1,578*	*1,545*	*1,457*
Red-throated Diver	48	60	35	116	339	179	130
Black-throated Diver	0	2	2	5	3	8	4
Great Northern Diver	0	0	0	27	17	9	5
Pied-billed Grebe	1	0	0	0	0	1	0
Little Grebe	2,301	2,275	1,833	1,716	1,790	1,697	1,233
Great Crested Grebe	7,658	8,260	6,327	6,043	6,529	5,850	5,820
Red-necked Grebe	5	8	6	9	9	14	5
Slavonian Grebe	0	9	15	34	63	57	39
Black-necked Grebe	13	11	42	31	25	38	13
Cormorant	8,138	11,076	10,131	9,348	9,970	10,726	8,099
Mute Swan	11,136	11,419	11,959	10,950	10,272	9,909	8,402
Black Swan	10	10	9	8	13	12	9
Trumpeter Swan	2	2	0	2	2	3	0
Bewick's Swan	3	89	2,317	5,477	6,464	6,245	214
Whooper Swan	10	558	1,112	1,192	1,549	1,739	1,503
Unidentified yellow-billed swan	0	0	75	0	0	0	0
Swan Goose	3	19	9	11	11	10	6
Bean Goose	0	0	5	43	424	74	1
Pink-footed Goose	32	+16,863	+33,337	65,223	+95,845	19,640	8,293
White-fronted Goose	0	0	9	0	29	0	4
European Whitefront	6	28	694	2,677	5,200	5,232	577
Greenland Whitefront	1	1	1	0	6	6	1
Lesser White-fronted Goose	0	1	1	0	0	0	3
Greylag Goose†	9,409	11,623	11,770	11,107	15,946	12,343	8,390
Bar-headed Goose	2	6	4	14	3	10	2
Snow Goose	74	39	55	65	66	64	68
Ross's Goose	0	15	16	2	17	13	13
Emperor Goose	0	0	0	1	0	0	0
Canada Goose	32,221	31,908	28,650	26,134	33,583	25,860	18,716
Barnacle Goose	339	164	2,346	6,305	1,655	3,255	8,284
Brent Goose††	1	0	1,598	2,495	332	320	71
Dark-bellied Brent	8,493	76,120	86,279	105,658	+124,243	+106,854	54,001
Light-bellied Brent	1,068	1	35	+2,160	922	17	19
Red-breasted Goose	0	0	0	0	0	0	0
Egyptian Goose	136	43	89	95	82	82	54
Feral/hybrid Goose	189	172	156	186	214	105	139
Ruddy Shelduck	3	1	1	3	5	2	5
Australian Shelduck	0	1	0	0	0	0	0
Shelduck	27,669	39,198	44,716	62,764	64,001	61,197	39,820
Muscovy Duck	5	57	2	67	81	61	66
Wood Duck	1	1	2	4	5	6	1
Mandarin	50	33	104	78	196	231	82
Wigeon	43,030	103,105	189,275	253,943	237,872	186,563	94,264
Chiloe Wigeon	1	0	0	0	0	0	0
Falcated Duck	0	0	0	0	1	0	0
Gadwall	5,207	6,277	8,434	9,094	7,359	7,538	3,675
Teal	41,349	63,816	69,592	99,747	79,219	74,890	39,240
Mallard	92,414	101,826	95,305	102,778	108,464	75,183	42,483
Pintail	6,138	10,301	11,651	16,649	16,090	14,171	4,321
Bahama Pintail	0	0	1	0	0	0	0
Garganey	19	1	2	1	0	0	4
Blue-winged Teal	0	0	0	0	0	0	0
Shoveler	6,819	5,703	6,641	6,580	5,930	6,147	4,869
Red-crested Pochard	64	53	109	86	99	92	46
Pochard	8,328	14,520	24,213	28,474	33,762	30,991	11,222
Ring-necked Duck	0	2	3	3	2	2	2
Ferruginous Duck	1	2	1	1	3	0	0
Tufted Duck	26,237	29,012	35,622	36,765	40,344	35,844	29,277
Scaup	7	43	120	215	1,745	225	263
Eider	7,752	7,310	9,064	4,498	4,032	3,975	5,580
Long-tailed Duck	1	5	35	268	128	115	72
Common Scoter	281	155	352	912	738	248	47
Velvet Scoter	0	18	10	93	6	1	0
Goldeneye	35	916	3,350	4,624	6,636	6,761	4,699
Hooded Merganser	0	0	0	0	0	0	0
Smew	0	2	6	83	120	127	40
Red-breasted Merganser	577	996	1,558	1,504	1,731	1,739	2,152

	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Goosander	271	457	533	1,276	1,602	1,683	1,054
Ruddy Duck	1,441	1,491	1,173	1,482	1,418	1,196	1,134
Feral/hybrid Mallard type	55	30	31	40	50	33	23
Hybrid Aythya	1	0	1	4	2	1	3
Water Rail	30	106	140	161	138	101	88
Moorhen	6,552	6,753	6,097	7,156	7,327	7,528	5,696
Coot	69,815	76,984	89,907	88,689	70,356	54,421	35,175
TOTAL WILDFOWL†††	**425,452**	**639,957**	**796,968**	**985,176**	**1,005,085**	**781,444**	**449,521**

Waders at estuarine/coastal sites	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Number of sites counted			*80*	*79*	*84*	*80*	*81*
Oystercatcher			139,249	144,857	137,374	130,852	77,246
Black-winged Stilt			0	1	1	1	1
Avocet			1,654	1,949	2,571	1,943	1,151
Little Ringed Plover			0	0	0	0	1
Ringed Plover			5,112	5,069	6,255	4,855	3,680
Kentish Plover			0	1	1	1	0
Golden Plover			49,785	59,687	73,129	26,341	9,586
Grey Plover			31,720	37,335	37,108	42,707	38,321
Lapwing			98,301	152,028	243,322	92,059	12,207
Knot			239,916	214,623	208,530	130,024	96,443
Sanderling			5,849	3,302	4,482	3,819	3,924
Little Stint			17	2	8	10	6
Curlew Sandpiper			1	0	0	0	2
Purple Sandpiper			715	770	912	609	499
Dunlin			300,168	333,731	382,555	346,081	188,068
Ruff			120	96	146	97	276
Jack Snipe			17	28	23	26	14
Snipe			1,625	2,030	1,840	1,533	965
Woodcock			10	8	5	0	0
Black-tailed Godwit			4,920	8,372	9,385	8,243	6,296
Bar-tailed Godwit			22,441	32,083	24,024	29,085	4,932
Whimbrel			9	6	4	4	2
Curlew			41,573	40,983	53,017	44,101	35,081
Spotted Redshank			46	39	46	50	39
Redshank			47,525	43,605	52,143	45,888	40,832
Greenshank			126	102	113	87	73
Green Sandpiper			37	25	21	25	28
Wood Sandpiper			0	0	1	0	0
Common Sandpiper			17	22	10	14	7
Turnstone			7,444	9,168	9,202	9,438	8,490
Grey Phalarope			0	0	1	0	0
TOTAL			**998,397**	**1,089,922**	**1,246,229**	**917,893**	**528,170**

\+ *Counts include data from the following goose censuses: national census of Pink-footed and Greylag Geese in October and November, with censuses of key roosts in January and March; January and February census of Dark-bellied Brent Geese; December census of Light-bellied Brent Geese on Lindisfarne; See Progress and Developments and Species Accounts for more details.*

† *Comprises mainly feral birds, and small numbers of the Icelandic breeding population*

†† *Indicates Brent Geese which were not identified to subspecies*

††† *Total wildfowl represents numbers of all divers, grebes, Cormorant, swans, geese, ducks and rails*

Footnote: Where a WeBS site crosses a country boundary (e.g. The Severn Estuary), only waterfowl within the English part of the site are included in the above table.

Appendix 4. TOTAL NUMBERS OF WATERFOWL RECORDED BY WeBS IN SCOTLAND DURING 1993-94.

	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Wildfowl at all sites							
Number of sites counted	*287*	*435*	*407*	*440*	*443*	*450*	*407*
Red-throated Diver	58	148	146	85	101	183	96
Black-throated Diver	1	2	9	18	8	16	4
Great Northern Diver	0	7	7	19	17	11	8
Little Grebe	376	343	174	130	142	126	114
Great Crested Grebe	586	380	241	236	308	763	244
Red-necked Grebe	13	6	13	6	14	10	6
Slavonian Grebe	3	27	50	31	50	43	41
Black-necked Grebe	1	0	0	0	4	2	1
Cormorant	1,551	2,661	2,037	2,716	2,412	4,077	1,503
Mute Swan	2,023	2,894	2,562	2,802	2,867	2,486	1,863
Black Swan	0	1	1	1	1	27	1
Bewick's Swan	0	17	18	14	28	5	5
Whooper Swan	9	1,089	2,079	1,520	1,343	873	771
Bean Goose	0	0	44	0	0	0	1
Pink-footed Goose	14,899	+207,491	+162,620	76,792	+64,967	38,654	+83,315
European Whitefront	14	14	15	14	1	15	1
Greenland Whitefront	0	535	+17,581	566	325	335	+15,617
Greylag Goose†	968	+80,412	+94,332	36,473	+38,569	13,898	+31,670
Snow Goose	4	3	3	2	1	4	5
Canada Goose	508	182	271	319	210	176	154
Barnacle Goose	17	21,922	+36,803	5,045	+35,672	9,203	+43,835
Brent Goose	0	0	0	0	7	0	0
Dark-bellied Brent	7	16	6	1	4	0	0
Light-bellied Brent	0	10	12	7	14	11	12
Red-breasted Goose	0	1	1	0	0	0	0
Egyptian Goose	0	0	1	0	0	0	0
Feral/hybrid Goose	0	0	0	0	0	0	0
Shelduck	644	1,680	3,819	5,506	6,130	6,428	2,739
Muscovy Duck	1	1	1	1	0	1	1
Wood Duck	0	1	1	0	0	1	1
Mandarin	1	2	2	0	0	0	0
Wigeon	7,775	62,652	31,468	57,344	42,490	34,973	11,864
American Wigeon	0	0	2	3	1	1	0
Gadwall	404	121	33	32	23	35	93
Teal	4,107	12,865	8,503	13,770	10,263	9,013	2,788
Mallard	17,807	25,617	21,845	29,577	28,483	22,352	7,228
Pintail	594	2,936	1,754	1,537	1,336	926	220
Shoveler	691	685	466	220	155	88	127
Red-crested Pochard	1	0	0	0	1	0	0
Pochard	1,484	3,134	4,375	4,581	2,863	2,995	1,657
Ring-necked Duck	0	0	1	0	0	0	0
Tufted Duck	7,413	7,144	6,312	8,219	7,840	6,442	5,112
Scaup	14	681	1,468	1,853	2,293	2,359	750
Eider	15,027	17,452	13,414	13,789	11,386	12,814	8,967
King Eider	1	0	1	0	2	3	0
Long-tailed Duck	1	1,088	1,795	2,544	1,590	2,885	1,105
Common Scoter	482	781	597	4,760	2,116	1,315	814
Surf Scoter	0	0	1	0	3	4	5
Velvet Scoter	99	96	102	159	576	503	459
Goldeneye	198	1,676	3,890	7,394	6,995	7,606	5,637
Smew	0	0	1	9	9	9	4
Red-breasted Merganser	872	1,952	1,066	1,476	2,356	4,040	988
Goosander	523	602	772	811	658	966	460
Ruddy Duck	67	34	15	6	1	2	7
Water Rail	16	12	7	6	6	3	5
Moorhen	715	646	575	471	440	432	384
Coot	4,862	5,886	6,466	6,145	5,192	4,656	3,082
TOTAL WILDFOWL††	**84,837**	**465,905**	**427,778**	**287,010**	**280,273**	**191,770**	**233,764**

Waders at estuarine/coastal sites	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Number of sites counted			*38*	*41*	*44*	*44*	*37*
Oystercatcher			43,558	61,915	52,220	53,421	28,415
Ringed Plover			1,834	2,113	1,637	1,928	834
Golden Plover			8,084	4,131	3,865	1,838	1,511
Grey Plover			1,979	1,767	1,671	1,626	1,815
Lapwing			8,663	11,449	11,581	7,314	1,723
Knot			14,804	28,009	22,321	25,494	6,915
Sanderling			248	313	232	315	107
Little Stint			6	0	0	0	0
Purple Sandpiper			198	517	436	743	292
Dunlin			18,769	42,077	38,914	36,027	6,736
Ruff			2	3	4	3	3
Jack Snipe			4	3	2	2	2
Snipe			260	165	246	196	121
Woodcock			0	1	0	0	1
Black-tailed Godwit			166	121	83	182	133
Bar-tailed Godwit			4,442	8,843	8,765	6,226	1,001
Whimbrel			1	3	0	0	0
Curlew			7,752	10,421	12,861	14,321	4,894
Redshank			10,471	17,557	15,305	16,761	6,676
Greenshank			23	23	14	13	10
Green Sandpiper			1	0	0	0	0
Common Sandpiper			3	1	1	0	0
Turnstone			2,694	3,372	3,222	3,376	2,388
TOTAL			**123,962**	**192,804**	**173,380**	**169,786**	**63,577**

\+ *Counts include data from the following goose censuses: national census of Pink-footed and Greylag Geese in October and November, with censuses of key roosts in January and March; international censuses of Greenland White-fronted Geese in November/December and March/April; December and March censuses of Barnacle Geese on Islay; December census of Barnacle Geese on the Solway; international censuses of Greenland White-fronted Geese in November/December and March/April. See Progress and Developments and Species Accounts for more details.*

† *Comprises mainly birds from the Icelandic breeding population, with up to 2,340 feral birds (Delany 1992)*

†† *Total wildfowl represents numbers of all divers, grebes, Cormorant, swans, geese, ducks and rails*

Footnote: Where a WeBS site crosses a country boundary (e.g. The Solway Estuary), only waterfowl within the Scottish part of the site are included in the above table.

Appendix 5. TOTAL NUMBERS OF WATERFOWL RECORDED BY WeBS IN WALES DURING 1993-94

Wildfowl at all sites	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
Number of sites counted	*164*	*198*	*211*	*213*	*205*	*198*	*183*
Red-throated Diver	30	74	292	17	27	8	5
Black-throated Diver	0	0	1	0	0	1	0
Great Northern Diver	0	0	1	2	3	3	0
Little Grebe	74	198	231	165	176	152	96
Great Crested Grebe	95	325	372	494	252	152	115
Red-necked Grebe	0	0	0	0	1	0	0
Slavonian Grebe	0	0	1	1	2	0	1
Black-necked Grebe	0	1	0	0	0	0	0
Cormorant	1,025	773	746	641	539	540	379
Mute Swan	368	398	428	405	313	245	276
Black Swan	0	2	1	0	0	0	0
Bewick's Swan	0	0	13	4	2	9	0
Whooper Swan	1	12	68	58	49	43	44
Pink-footed Goose	0	6	1	5	2	1	1
European Whitefront	0	0	0	9	0	42	1
Greenland Whitefront	0	47	+124	113	125	124	+124
Greylag Goose	286	606	349	153	706	396	110
Bar-headed Goose	2	2	0	1	2	0	0
Canada Goose	439	1,209	1,270	1,059	1,235	1,188	504
Barnacle Goose	1	1	18	20	18	18	3
Brent Goose	0	2	2	0	0	0	0
Dark-bellied Brent	0	262	670	868	822	801	512
Light-bellied Brent	0	13	31	31	45	47	29
Egyptian Goose	1	2	2	1	1	1	1
Feral/hybrid Goose	0	0	0	0	2	2	1
Ruddy Shelduck	0	0	0	0	0	0	1
Shelduck	330	1,450	3,422	4,647	4,914	5,101	4,184
Mandarin	1	0	1	1	1	0	1
Wigeon	4,038	11,489	13,480	15,720	11,054	6,561	1,345
Gadwall	10	50	85	108	87	92	56
Teal	1,702	3,456	5,941	6,650	6,009	3,905	1,637
Mallard	6,005	7,044	6,964	6,830	5,850	3,824	1,932
Pintail	230	371	2,062	1,101	2,223	1,374	55
Shoveler	73	126	222	470	515	378	216
Red-crested Pochard	1	2	3	3	3	2	2
Pochard	155	563	934	1,311	1,144	1,036	519
Tufted Duck	910	995	1,332	983	1,267	1,216	897
Scaup	1	38	89	220	100	70	22
Eider	0	21	24	1	62	1	5
Long-tailed Duck	0	0	0	1	1	0	0
Common Scoter	20	1,302	5,781	6,071	2,574	366	532
Velvet Scoter	0	0	1	0	4	4	2
Goldeneye	2	50	186	426	565	491	449
Smew	0	0	4	6	15	3	1
Red-breasted Merganser	275	280	228	204	194	142	165
Goosander	10	36	60	129	84	56	81
Ruddy Duck	17	137	142	163	172	111	112
Hybrid Aythya	0	0	1	0	0	0	0
Water Rail	7	6	10	10	6	4	2
Moorhen	166	200	232	223	230	220	147
Coot	1,628	2,800	3,177	2,872	2,449	2,087	1,280
TOTAL WILDFOWL†	**17,903**	**34,349**	**49,002**	**52,197**	**43,845**	**30,817**	**15,845**

Waders at estuarine/coastal sites	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
Number of sites counted	*24*	*23*	*21*	*21*	*18*
Oystercatcher	32,897	28,620	27,568	25,492	14,502
Ringed Plover	582	796	815	779	283
Golden Plover	4,850	3,191	236	1,702	32
Grey Plover	668	352	926	899	339
Lapwing	5,889	6,002	7,677	3,786	482
Knot	3,181	4,634	3,144	3,744	853
Sanderling	1,056	812	371	127	604
Little Stint	2	0	0	0	1
Curlew Sandpiper	5	2	0	0	0
Purple Sandpiper	2	0	5	2	0
Dunlin	21,242	19,264	32,724	34,616	5,927
Jack Snipe	3	4	9	0	2
Snipe	258	352	248	58	70
Woodcock	0	3	2	0	0
Black-tailed Godwit	2,094	1,078	614	630	66
Bar-tailed Godwit	128	202	175	489	89
Whimbrel	0	0	0	1	3
Curlew	8,415	6,724	9,044	8,825	4,866
Spotted Redshank	7	4	3	4	4
Redshank	6,132	4,507	6,005	4,457	3,182
Greenshank	30	30	20	26	13
Green Sandpiper	12	2	5	3	3
Common Sandpiper	2	4	1	1	0
Turnstone	685	1,045	1,036	502	426
TOTAL	**88,140**	**77,628**	**90,628**	**86,143**	**31,747**

\+ *Counts include data from the following goose censuses: international censuses of Greenland White-fronted Geese in November/December and March/April. See Progress and Developments and Species Accounts for more details.*

† *Total wildfowl represents numbers of all divers, grebes, Cormorant, swans, geese, ducks and rails*

Footnote: Where a WeBS site crosses a country boundary (e.g. The Severn Estuary), only waterfowl within the Welsh part of the site are included in the above table.

Appendix 6. TOTAL NUMBERS OF WATERFOWL RECORDED BY WeBS IN THE ISLE OF MAN DURING 1993-94.

Wildfowl at all sites	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
Number of sites counted	*0*	*1*	*1*	*1*	*1*	*1*	*1*
Little Grebe		1	1	0	0	0	0
Cormorant		4	5	15	8	12	4
Mute Swan		0	0	0	0	0	2
Dark-bellied Brent		0	0	0	0	8	8
Light-bellied Brent		0	0	0	0	4	4
Shelduck		0	0	0	18	23	30
Wigeon		61	159	142	138	182	60
Teal		73	280	120	171	55	62
Mallard		227	240	51	175	60	42
Shoveler		0	0	0	0	1	0
Goldeneye		0	0	0	0	2	0
TOTAL WILDFOWL†		**366**	**685**	**328**	**510**	**347**	**212**

† *Total wildfowl represents numbers of all divers, grebes, Cormorant, swans, geese, ducks and rails*

Footnote: No counts of waders at estuarine/coastal sites were made on the Isle of Man in 1993-94.

Appendix 7. TOTAL NUMBERS OF WATERFOWL RECORDED BY WeBS IN THE CHANNEL ISLANDS DURING 1993-94.

	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Wildfowl at all sites							
Number of sites counted	*1*	*11*	*13*	*25*	*27*	*26*	*10*
Great Northern Diver	0	0	0	0	0	1	0
Little Grebe	0	2	5	0	2	2	2
Great Crested Grebe	0	0	0	0	3	4	1
Slavonian Grebe	0	0	0	2	1	4	0
Cormorant	10	16	17	26	16	18	9
Dark-bellied Brent	0	1	65	80	235	276	161
Feral/hybrid Goose	0	2	2	2	3	2	0
Shelduck	1	0	0	0	0	0	0
Wigeon	0	0	7	14	14	4	0
Gadwall	0	0	6	14	4	2	3
Teal	0	0	24	25	43	45	27
Mallard	2	119	233	97	140	131	18
Pintail	0	0	0	0	1	0	0
Garganey	0	0	0	0	0	0	1
Shoveler	0	0	10	56	53	12	23
Pochard	0	0	10	10	6	1	1
Tufted Duck	0	41	54	50	10	47	4
Red-breasted Merganser	0	0	0	0	0	0	1
Ruddy Duck	0	0	0	1	0	0	0
Water Rail	0	2	0	0	3	0	0
Moorhen	0	30	57	43	72	67	8
Coot	0	27	42	61	48	42	0
TOTAL WILDFOWL†	**13**	**240**	**532**	**481**	**654**	**658**	**259**
Waders at estuaries/coastal sites							
Number of sites counted			*1*	2	2	2	*1*
Oystercatcher			846	2,367	2,278	2,402	384
Ringed Plover			233	445	416	228	23
Golden Plover			0	84	1	31	0
Grey Plover			97	705	698	801	51
Lapwing			2	25	20	60	0
Sanderling			53	188	295	491	15
Purple Sandpiper			2	18	6	15	7
Dunlin			58	717	2,873	2,626	18
Snipe			16	22	12	0	0
Bar-tailed Godwit			1	119	262	417	0
Curlew			170	462	665	266	9
Spotted Redshank			0	0	1	1	0
Redshank			40	194	408	470	19
Greenshank			0	2	8	12	0
Turnstone			637	871	1,155	1,092	428
TOTAL			**2,155**	**6,219**	**9,098**	**8,912**	**954**

† *Total wildfowl represents numbers of all divers, grebes, Cormorant, swans, geese, ducks and rails*

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