The Wetland Bird Survey 1996-97

Wildfowl and Wader Counts

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The Wetland Bird Survey 1996-97:
Wildfowl and Wader Counts

The results of the Wetland Bird Survey in 1996-97

by

R.J. Waters, P.A. Cranswick, A.J. Musgrove & M.S. Pollitt

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WETLAND BIRD SURVEY

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Low Tide Counts - **Andrew Musgrove**, BTO

Please note that, by the time of publication of this report, the administration of Core Counts had been reorganised. For queries regarding Core Counts, both for wildfowl and waders, please contact the WeBS Secretariat at WWT. Please contact Andy Musgrove, BTO, for enquiries regarding Low Tide Counts.

This report is provided free to all WeBS counters, none of whom receive financial rewards for their invaluable work. Further feedback from BTO and WWT HQs is provided to counters in the form of the *WeBS Newsletter*. More detailed data than presented in this report can be obtained through the relevant organiser.

ACKNOWLEDGEMENTS

This book represents the eighteenth report of the Wetland Bird Survey (previously the National Waterfowl Counts and the Birds of Estuaries Enquiry). It provides a national overview of the count information, collected during 1996-97 and previous years, which is critical to the conservation of waterfowl populations both within the United Kingdom and internationally. It is entirely dependent on the many thousands of dedicated volunteer ornithologists who supply the data and to whom we are extremely grateful. The Local Organisers who co-ordinate these counts deserve special thanks.

We are also grateful to the following people for providing technical assistance, supplementary information and comments on the draft texts, and especially to those who wrote sections of text for the report:

Graham Austin (BTO), Jeff Black (WWT), Karl Evans (BTO), Liz Flowers (BTO), Tony Fox (GWGS), Rachel Priday (WWT), David Gibbons (RSPB), Stephen Holloway (BTO), Baz Hughes (WWT), Becky Hughes (WWT), Rowena Langston (RSPB), Margaret McKay (SNH), Liz McTeague (SNH), Carl Mitchell (WWT), David Norriss (NPWS), Steve Percival, Nicola Read (BTO), Mark Rehfisch (BTO), Barry Stewart (WWT), David Stroud (JNCC) and Paul Walkden (WWT). Many amateur observers also provide us with reports of their studies; these are acknowledged in the text.

The maps of coverage and sites were produced using DMAP. The section on weather was summarised from monthly weather logs published in the journal *Weather*.

The cover painting of a Water Rail is by Terence Lambert. Fifty numbered and signed prints of the cover have been donated by Terence for sale at £20 plus £1.50 p&p. Proceeds will be used to fund wetland research. Please send cheques to or contact WeBS at WWT, Slimbridge, for further details.

ERRATA

Given the amount of data processed and presented, it is perhaps inevitable that some mistakes will occur when preparing this report. Where we are made aware of these, they will be corrected in future years' reports, whilst data received late may similarly alter figures in the tables from one year to the next. This section is used to highlight significant errors in previous reports, particularly where it is not possible to provide corrections in the main part of subsequent reports.

Corrections to the 1995-96 report

Please note the record of Hudsonian Godwit on page 104 is incorrect and should be deleted. Unfortunately a record of Mediterranean Gull (MU) was input as HU by mistake.

The Wetland Bird Survey 1996-97:
Wildfowl and Wader Counts

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SUMMARY

The Wetland Bird Survey and Wildfowl and Wader Counts

The Wetland Bird Survey (WeBS) is a joint scheme of the British Trust for Ornithology (BTO), The Wildfowl & Wetlands Trust (WWT), Royal Society for the Protection of Birds (RSPB) and Joint Nature Conservation Committee (JNCC) to monitor non-breeding waterfowl in the UK. The principal aims of the scheme are to identify population sizes, determine trends in numbers and distribution, and to identify important sites for divers, grebes, Cormorant, herons, wildfowl, rails, waders, gulls, terns and Kingfisher. So called Core Counts are made annually at around 2,000 wetland sites of all habitats; estuaries and large still waters predominate. Monthly co-ordinated counts are made mostly by volunteers, principally from September to March, with fewer observations during summer months. Data from other sources, e.g. roost counts of grey geese, are included in this report where relevant.

This report presents total numbers counted for all species in the most recent year in Great Britain and Northern Ireland. Indices are provided, calculated using the 'Underhill' method, for more numerous species for which sufficient Core Count data exist. For certain wildfowl species, relative abundance during the winter months is also provided.

Species accounts provide yearly maxima for all sites supporting internationally and nationally important numbers. Significant counts at a national or site level are discussed, counts are placed in an international context where possible, and relevant research is summarised.

Waterfowl totals are provided for all sites meeting criteria for international importance and for all estuaries, and species occurring in internationally important numbers on each are identified.

A brief overview of research initiated by WeBS or using WeBS data and of conservation issues pertaining to UK waterfowl is provided.

WeBS Low Tide Counts are made on selected estuaries to determine the distribution of birds during low tide and to identify important feeding areas that may not be recognised during Core Counts which are made mostly at high tide. A summary of results for these estuaries, and distribution maps for selected species, are provided.

A summary of data collected by the Irish Wetland Bird Survey, a similar scheme operating in the Republic of Ireland, is also included.

Appendices list all UK sites identified under the Ramsar Convention and Special Protection Areas notified under the EC Directive on the Conservation of Wild Birds. Also, waterfowl count totals for the most recent year are provided separately for England, Scotland, Wales, the Isle of Man and the Channel Islands.

The 1996-97 year

This report summarises counts during 1996-97 and previous years (since 1960 for wildfowl, 1969 for waders and the early 1980s and 1990s for other species groups). Coverage remained at the same relatively high levels achieved throughout the 1990s, with around 1,500 sites covered during each winter month. There was a marked cold spell in January in the UK and the near continent with corresponding increases in counts of several species.

Divers and grebes were generally recorded in slightly lower numbers than during recent years. Heron numbers were about average, although there was an influx of small numbers of Bitterns in mid winter. Cormorant numbers were lower than in the most recent seasons, though numbers remained above early 1990s levels.

Numbers of migratory swans were the highest since the early 1990s and high or record numbers were recorded for many goose species: European Whitefronts surpassed 7,000 for the first time in a decade; native Scottish and naturalised Greylag Goose numbers both reached record highs, although the Icelandic population continued its gradual decline, numbering less than 80,000; the population of Svalbard Barnacle Geese reached an all-time high of 24,360; and over 4,000 Svalbard Light-bellied Brent Geese were recorded on Lindisfarne when the whole population left Denmark during the cold weather.

Record numbers of Wigeon (over 400,000) were counted in January. Numbers of Pochard and Tufted Duck were the lowest for a decade. There was an influx of sawbills from the continent during the cold weather, with the count of 6,500 Goosander in January being 50% higher than the previous record count.

Winter maxima for most wader species were similar to those of previous winters, although there was a marked fall in numbers of Lapwing and Golden Plover in January, coinciding with the cold weather. High counts of Bar-tailed Godwit and Dunlin were noteworthy, with index values for reaching record levels for the former and reaching the highest level for 20 years for the latter. Index values Grey Plover, Black-tailed Godwit and Sanderling also reached all-time highs, and that for Oystercatcher was the highest since 1990-91. Large numbers of Little Stints and Curlew Sandpipers were recorded on autumn passage.

Numbers of gulls and most terns were similar to those of previous seasons, although counts of Arctic and Little Terns were markedly lower than during 1995-96.

A summary of WeBS Low Tide data is presented for 16 estuaries counted in 1996-97: Alt, Beaulieu, Belfast Lough, Burry Inlet, Chichester Harbour, Conwy, Dee (England/Wales), Dundrum Bay, Findhorn Bay, Medway, Mersey, Orwell, Pagham Harbour, Southampton Water, Stour and Tees.

INTRODUCTION

The UK is of outstanding international importance for waterfowl, especially during winter when they are attracted by the relatively mild climate and extensive areas of wetland, notably estuaries. As such, the UK has an obligation to protect and conserve both these waterfowl and the wetlands upon which they depend.

The Wetland Bird Survey (WeBS) aims to monitor all non-breeding waterfowl in the UK to provide the principal data on which the conservation of their populations and wetland habitats is based. To this end, WeBS has four main objectives:

- to assess the size of non-breeding waterfowl populations in the UK;
- to assess trends in their numbers and distribution;
- to assess the importance of individual sites for waterfowl; and
- to understand the ecology of waterfowl, including the effects of habitat change and anthropogenic impact.

This report presents syntheses of data collected in 1996-97 and previous years in line with these objectives.

The WeBS scheme, officially launched in October 1993, continues the traditions of two, long running count schemes which had formed the mainstay of waterfowl monitoring in the UK since 1947 (see Cranswick *et al.* 1997). WeBS is funded by the British Trust for Ornithology (BTO), The Wildfowl & Wetlands Trust (WWT), Royal Society for the Protection of Birds (RSPB) and the Joint Nature Conservation Committee (JNCC), the last on behalf of English Nature (EN), Scottish Natural Heritage (SNH) and the Countryside Council for Wales (CCW), and the Environment and Heritage Service in Northern Ireland (EHS). All four WeBS partners take an active role in the planning of the scheme and the rolling programme of analyses that use WeBS data.

Core Counts are made at a wide variety of wetlands throughout the UK. Synchronised counts are conducted once per month, primarily from September to March, although some sites are counted year round.

In addition, Low Tide Counts are undertaken on selected estuaries with the aim of identifying key areas used during the low tide period, principally by feeding birds; areas otherwise not noted for their importance by Core Counts which are normally conducted during high tide.

The success and growth of these count schemes reflects accurately the enthusiasm and dedication of the several thousands of volunteer ornithologists throughout the UK who participate. It is largely due to their efforts that waterfowl monitoring in the UK is held in international high regard.

The day-to-day running of the Core and Low Tide Count schemes is the responsibility of the National Organisers, listed inside the cover of this report, with assistance from a number of other staff. We recommend that these people are contacted in the first instance by anyone with queries regarding this report or requiring further information.

PROGRESS AND DEVELOPMENTS

The relationship between waterfowl roosting and feeding numbers

Population estimates of estuarine waterfowl in the UK are derived from WeBS Core Counts, which mostly take place at high tide. Although the WeBS Low Tide Counts are principally concerned with examining the feeding distribution of estuarine waterfowl, the counts made on different mudflats can also be summed to give an estimate of the population of waterfowl within an estuary at low tide. A comparison of numbers derived from low tide counts with those from high tide core counts has recently been made using WeBS data for 39 estuaries, in order to quantify the relationship between the data collected by the two schemes. Overall, the low tide counts on average recorded about 79% of the total number of birds observed at high tide. A similar proportion (85%) was calculated for all waders combined, but for the combined estuarine wildfowl, the low tide count total was only 48% of the high tide count. The degree of agreement between high and low tide counts varied between individual species. There was little overall difference between the counts made at high and low tide for Grey Plover, Purple Sandpiper, Dunlin and Bar-tailed Godwit. However, Knot and Greenshank were counted in significantly higher numbers at low tide than at high tide. The remaining common species were counted in significantly higher numbers at high tide than at low tide. Analysis of the relationship between the difference in low tide and high tide counts, and a range of external estuarine variables (including measures of estuary size, geographical location and climate) revealed that the difference in counts was related most strongly to the intertidal area. High tide counts were increasingly greater than low tide counts the larger the intertidal area of an estuary, presumably due to the physical difficulties of counting estuarine birds at the greater distances to be found at low tide (Musgrove 1997).

Counting waterfowl on large estuaries at low tide

Large estuaries present particular problems for assessing low tide distributions of birds. Recently, the BTO has undertaken a review of the issues involved and made recommendations for future surveys. The literature concerning how birds have been surveyed on large estuaries was reviewed and a number of case studies discussed. Fieldwork carried out on the Wash provided first-hand experience of the sorts of problems that counters face on very large estuaries such as the Humber, Morecambe Bay, the Ribble, the Severn and the Solway. The report concludes that counting large estuaries at low tide is likely to lead to significant under-estimates of waterfowl numbers. Counts can sometimes be improved by observers walking out on the mudflats but there are

safety implications. Additionally there are some parts of large estuaries that cannot be reached on foot at all. Aerial surveys would make it possible to achieve complete coverage of very large sites, and should be able to highlight the wader "hot-spots" on the intertidal flats, but may seriously undercount many species (Musgrove & Holloway 1997).

The Non-estuarine Coastal Waterfowl Survey (NEWS)

The 1997-98 Non-estuarine Coastal Waterfowl Survey (NEWS) will give the first systematic coverage of non-estuarine habitats since the 1984-85 Winter Shorebird Count (WSC) which covered more than 90% of the UK's non-estuarine coastline. The coverage for NEWS should approach this figure. We have been promised coverage from every county in the UK, with the east coast being particularly well covered. In Northern Ireland too, levels of coverage are likely to be high.

On a more international note, the interest in NEWS within Europe continued to grow during 1997, and we finished with 14 countries involved including Iceland, Norway and Sweden in northern Europe and Croatia in southern Europe. The degree of coverage varied from country to country, but all the results should contribute to the update of the East Atlantic Flyway and perhaps the Northwest European population estimates for some waterfowl. For some of the countries involved, NEWS will produce baseline population estimates for the first time, whilst for others it will update existing population estimates.

Once the dust has finally settled and all the analyses have been completed, it will be time to look at the future needs for surveying non-estuarine habitats. There appear to be two main options available. The first is to try and repeat full scale NEWS on a regular basis, say every six or nine years. This however, would be logistically very demanding and may lead to many regular WeBS counters and local organisers becoming tired of further involvement with yet more waterfowl surveys. The second option would involve annually counting an increased proportion of non-estuarine coastline within the WeBS Core Counts. This would make it possible to follow more closely the population changes and estimate the population sizes of our, as yet, little known non-estuarine waders and wildfowl. Whatever the future of NEWS, thanks go to all of you who took part during 1997-98.

Regional indexing of waders in Britain

Using data collected for WeBS from 1969-70 to 1995-96, Isobel Peachel analysed regional trends in winter wader populations to assess whether trends seen at the national level were evident at a regional scale. This updated the regional analyses carried out in 1994 (Austin *et al.* 1995). For this study, Britain was divided into nine regions (Owen *et al.* 1986). Although population trends tended to be similar for most species within and across regions, there were two major exceptions. First, the population trends of Avocets were markedly different to those of the other species. In the early days of monitoring, the Avocet was a relatively rare species, but since then its numbers in the south and south-east region of England have increased dramatically (Figure 1). Its index for the region of south and south-east of England has now exceeded 15,000 which implies that there has been an increase of 14,900% in Avocet numbers between the winters of 1969-70 and 1995-96. Second, most species' indices showed a greater increase in the south and south-east of England than elsewhere. Over the 26 year period, the numbers of seven of the 12 species studied increased in south and south-east England but remained static or declined in the region of south-west England and south Wales. Some examples are shown in Figure 1. Work is currently being undertaken to investigate the possible causes of these regional declines in Wales.

Two other specific regional changes were also noted. In the north and north-east of Scotland especially, but also in several other regions, increases in the number of Curlews occurred after 1981-82, when the species stopped being a legal quarry species. A deterioration in the shellfish stocks of the Wash may be responsible for the rapid decline in Oystercatcher and Knot numbers observed in east England after 1988-89.

WeBS database

During the course of 1997, the BTO continued to devote considerable resources to the development of the new WeBS database. This project is now virtually completed. From the counters perspective, little will change so far as the collection and submission of data are concerned. The great benefit of the new system will be improvements in the collating and disseminating of WeBS data. This process is now far more streamlined and efficient with less scope for human error. New data will be incorporated and be available to outside parties earlier than it has in the past. All in all, WeBS will be able to offer an all round better service, supplying more up to date information.

All wader, gull, tern, heron and Kingfisher data have now been incorporated in the new database. The data presented for these species groups in this report were also processed using the new system.

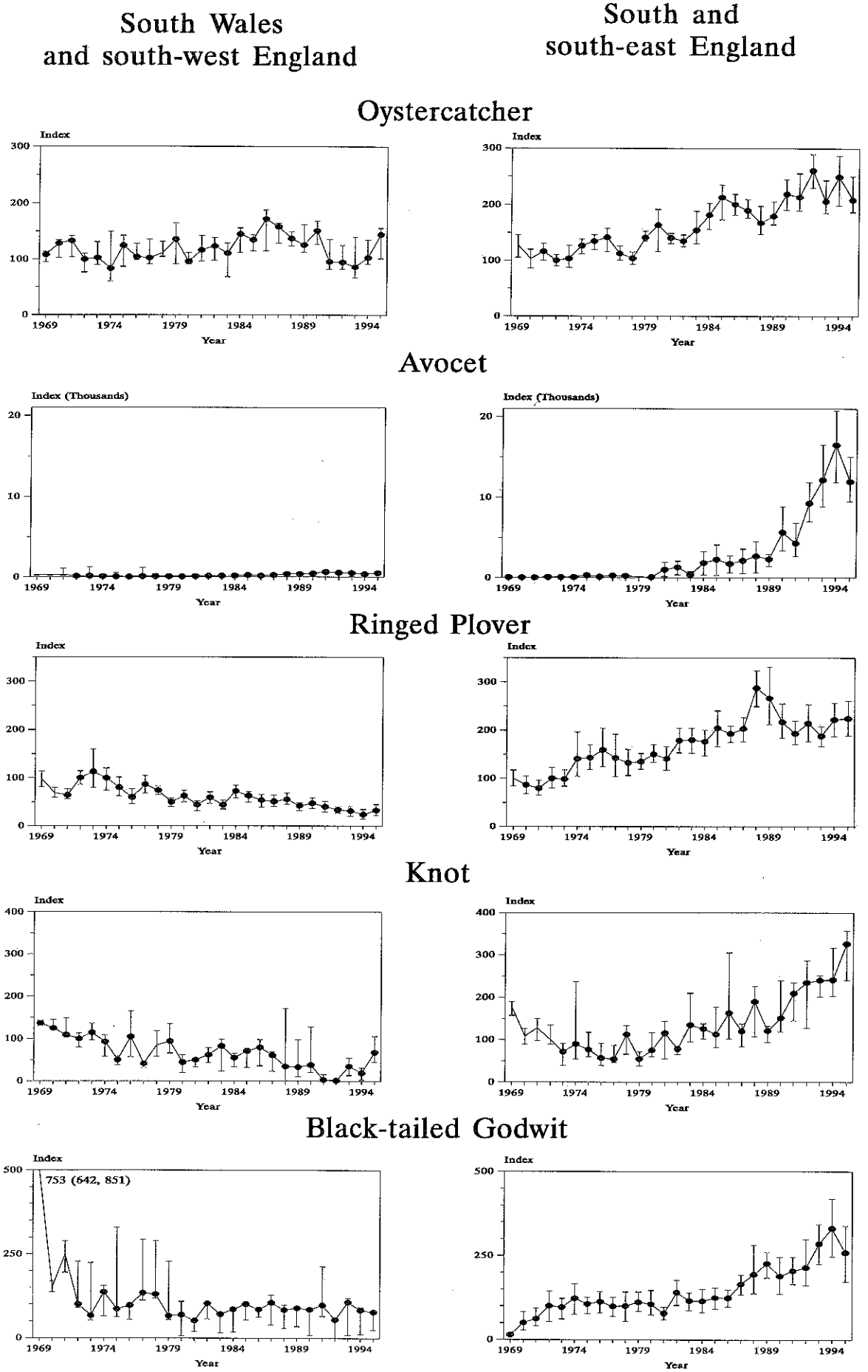

Figure 1. Comparison of the indices of five species of wader in south and south-east England and in south-west England and south Wales (note different scales for the index axes). Index values marked with a ● are calculated using data with less than 50% imputed counts.

SURVEYS AND PROJECTS

WWT and other Goose Censuses

In 1996-97, as in previous years, national surveys of Pink-footed and Icelandic Greylag Geese were undertaken in October and November (Mitchell 1997), involving counts of birds arriving at or leaving roosts. Censuses of the native Scottish population on the Uists were made in August and February (WWT unpubl. data). Full censuses of Greenland White-fronted Geese, including birds in Ireland, were undertaken in autumn 1996 and spring 1997 by the Greenland White-fronted Goose Study and Irish National Parks and Wildlife Service (Fox & Francis 1997). Greenland Barnacle Geese were counted regularly by SNH and others on Islay (M. McKay *in litt.*) and the Svalbard population was counted frequently on the Solway Firth by WWT staff (WWT unpubl. data). Dark-bellied Brent Geese were censused in January and February by the WeBS network, with counters at key sites making special effort to locate birds using adjacent areas, particularly fields, which would ordinarily be missed during normal Core Counts.

Breeding performance of swans and geese

Many goose surveys included age-counts of arctic nesting geese, made to assess the often dramatically varying breeding productivity of these birds. The results of these censuses for the last two years, and those of age counts of yellow-billed swans made at WWT Centres, are summarised below (see *Species Accounts* for the relevant references).

Species	% juv	brood
Bewick's Swan	11-13	n/a
Whooper Swan	14-16.6	n/a
Pink-footed Goose	18.8	2.4
European Whitefront	20	3.09
Greenland Whitefront	7.14	3.01
Icelandic Greylag	19.9	2.63
Hebridean Greylag	n/a	n/a
Greenland Barnacle	10.73	2.3
Svalbard Barnacle	16.1	1.74
Dark-bellied Brent	8.3	2.27
Canadian Light-bellied Brent	2.5	n/a
Svalbard Light-bellied Brent	21	n/a

The proportions of young in most migratory swan and goose populations in 1996 were similar to those of recent years. Icelandic Pink-footed and Greylag Geese breeding success recovered to normal levels after a poor year in 1995. However, Greenland Whitefront levels were lower than normal and, with the exception of the Svalbard Light-bellied population, Brent populations exhibited continued low levels of breeding success.

CONSERVATION AND MANAGEMENT

Site designations

Any site recognised as being of international ornithological importance is considered for classification as a Special Protection Area (SPA) under the EEC Directive on the Conservation of Wild Birds (EC/79/409), whilst a site recognised as an internationally important wetland qualifies for designation as a Ramsar site under the Convention on Wetlands of International Importance especially as Waterfowl Habitat. Criteria for recognising internationally important concentrations of waterfowl have been agreed by the Contracting Parties to the Ramsar Convention and require a site regularly to support either at least 1% of the international population of a particular species or sub-species, or a total of more than 20,000 waterfowl of all species (see Appendix 1 for further details). A list of proposed SPAs and Ramsar sites in the UK, including those identified for their importance for waterfowl, is maintained by JNCC (see Stroud *et al.* 1990). A total of 27 SPAs and 10 Ramsar Sites were designated in the UK between 1 December 1996 and 31 December 1997 (see Appendix 1 for further details).

WEATHER

Continuing dry easterly winds resulted in well below average temperatures for the first half of **April** (21st[1]). Changeable conditions during the third week brought frequent rain and showers to northern and western Britain, and unusually frequent southerly airflows raised mean temperatures for the month as a whole above the long-term norm. Southeast England remained exceptionally dry. A cold spell, with bitter north-easterly winds, at the end of the month continued into **May** (19th), which, as a whole, was one of the coldest Mays this century. A depression tracking westerly on the 19th brought heavy rain to the southwest and Wales and the first completely frost-free night of the month. Unsettled conditions followed bringing rain to many areas. **June** (16th) was sunny and dry for most parts, with very warm days and cool nights. Early in the month, southern districts baked in temperatures of 30°C and more, whilst northern and western areas had cooler conditions with occasional rain. Rainfall totals were typically less than 30% of the monthly average in eastern and southern areas. Atlantic fronts brought cooler and wetter weather from the west in early **July** (21st), though more settled conditions saw temperatures rise again mid-month. The warm, sultry weather was broken by thunderstorms in many areas, creating a very uneven rainfall distribution. Overall rainfall was again below average in most places. Unsettled conditions interspersed with bouts of high pressure characterised **August** (18th). Temperatures were warmer than the long-term mean though not exceptionally so. Heavy showers meant rainfall

[1] Priority dates for WeBS counts in each month are given in brackets. See Coverage for further details.

nationally was near normal, though distribution was again very variable.

September (15th) was dominated by anticyclonic conditions, with high-pressure systems blocking the Atlantic fronts. Easterly airflows followed as the high pressure drifted northwards on the 18th and 19th, though it was not until the 24th that the fronts to the west began to progress across the country. Another dry month, with rainfall well below average almost everywhere, the only significant amounts falling in the last week.

Southerly and westerly winds prevailed throughout **October** (13th) bringing more mixed weather. Overall, temperatures and rainfall were slightly higher than average, though this disguises considerable regional variation with many northern and western areas receiving up to twice the normal amount of rainfall and areas of East Anglia and the southeast recording a deficit of around 30%.

Southwesterly airflow in early **November** (17th) brought prolonged heavy rain to almost all areas of the country and gales across northern Britain. An intense depression swept across southern England on the 19th, bringing gales and torrential downpours and blizzard conditions in more northern and central districts. The month ended with further fronts from the Atlantic bringing widespread rain and gales. Overall, November was cold, with rainfall well above the norm in all areas.

As in 1995, **December** (15th) was dominated by easterly airflows, with consequently low rainfall and temperatures typically 1-2°C below normal. Unsettled weather continued at the start of the month, but high pressure centred between Scotland and Iceland from the 21st to the month end brought very cold temperatures across the whole of the country; daytime temperatures failed to rise above freezing in many places on 30th and 31st.

The cold spell continued into the first two weeks of **January** (12th), and many places continued to record day maxima below 0°C. South to southwesterly winds and milder temperatures returned on the 11th, though the influence of the persistent high over continental Europe ensured that rain-bearing westerlies were still a rarity. Fog was widespread throughout England and Wales from 14th-16th. A further high pressure system drifted across the UK in the last few days of January, though conditions were not as severe as those earlier in the month. Rainfall was exceptionally low, with England and Wales recording the driest January since 1779, whilst temperatures in some areas of southern England were colder than Scotland.

In contrast **February** (9th) was dominated by wet and windy weather, with an almost unbroken stream of Atlantic disturbances affecting the UK. All parts of the country recorded above average daytime temperatures, typically 2-3°C above the norm, and many were affected by gales as a series of squally low pressures tracked eastwards across the country. Despite above average rainfall in nearly all areas, particularly in Scotland and northern England, concerns over falling groundwater levels still persisted.

The winter closed with a very mild **March** (9th), with no cold spells and, with the exception of northern and western parts of Scotland, exceptionally dry in all areas. Dense fog, however, affected many areas from 10th-12th. Temperatures were, on average, warmer than a normal April, and the Central England Temperature was the third highest in the 338 year long series. The continued lack of rainfall has caught the media's attention, with some statisticians suggesting we are currently experiencing one of the longest dry spells in over 200 years.

The proportion of still water count units (lakes, reservoirs and gravel pits) with any ice and with three-quarters or more of their surface covered by ice during WeBS counts (England divided by a line drawn roughly between the Humber and the Mersey Estuaries).

Region	Ice	S	O	N	D	J	F	M
Northern Ireland	>0%	0	0	0	0	1	0	0
	>74%	0	0	0	0	0	0	0
Scotland	>0%	0	0	22	24	36	1	1
	>74%	0	0	14	12	23	0	0
N England	>0%	0	0	1	4	44	1	0
	>74%	0	0	0	2	29	0	0
S England	>0%	0	0	1	8	59	1	0
	>74%	0	0	0	4	48	0	0
Wales	>0%	0	0	0	7	41	2	0
	>74%	0	0	0	6	27	0	0

In Northwest Europe, September began colder than normal in most places with the exception of Iceland, where temperatures were 2-3°C above normal. October and November were mild, notably so in Scandinavia and western Russia, whilst more westerly parts experienced temperatures and rainfall nearer to the long -term average. The cold spell that hit the UK in late December was also experienced on the continent, with mean monthly temperatures 2-4°C below normal and very little rainfall in western and central Europe. Cold conditions continued into early January, with most countries, except those in Scandinavia and Iceland, experiencing the lowest temperatures in the first thee days of the month. As in December, temperatures were again around 2-3°C below normal, though Scandinavian and Baltic states fared better with temperatures near or slightly above the norm. Rainfall was again low with some cities in Germany, the Netherlands and Slovakia recording less than 10% of the average precipitation. February was much milder and wetter, temperatures everywhere being 2-5°C above average. The particularly mild conditions continued into early March though, as in the UK, many places recorded well below average rainfall.

WeBS Core Counts

INTERPRETATION OF WATERFOWL COUNTS

Caution is always necessary in the interpretation and application of waterfowl counts given the limitations of these data. This is especially true of the summary form which, by necessity, is used in this report. The primary aim here remains the rapid feedback of key results to the many participants in the WeBS scheme. More detailed information on how to make use of the data for research or site assessment purposes can be obtained from the appropriate organisations.

Explanation of the basis for the qualifying levels used for defining both the international and national importance of sites is provided in Appendix 1. It is necessary to bear in mind the distinction between sites that *regularly* hold wintering populations of national/international importance and those which may happen to exceed the appropriate qualifying levels only in occasional winters. This follows the recommendation of the Ramsar Convention, which states that key sites identified on the basis of numbers of birds should support such numbers on a regular basis (calculated as the mean winter maxima from the last five seasons for most species in this report. Nevertheless, sites which irregularly support nationally/internationally important numbers may be extremely important at certain times, e.g. when the UK population is high, during the main migratory periods, or during cold weather, when they may act as refuges for birds away from traditionally used sites. For this reason also, the ranking of sites according to the total numbers of birds they support (e.g. *Principal Sites*) should not be taken as a rank order of the conservation importance of these sites, since certain sites, perhaps low down in terms of their total 'average' numbers, may nevertheless be of critical importance to certain species or populations at particular times.

Peak counts derived from a number of visits to a particular site in a given season will reflect more accurately the relative importance of the site for the species than do single visits. It is important to bear this in mind since, despite considerable improvements in coverage, data for a few sites presented in this report derive from single counts during 1996-97. Similarly, in assessing the importance of a site, peak counts from several winters should ideally be used, as the peak count made in any one year may be unreliable due to gaps in coverage and disturbance- or weather-induced effects. The short-term movement of birds between closely adjacent sites may lead to altered assessments of a site's apparent importance for a particular species. More frequent counts than the once-monthly WeBS visits are necessary to assess more accurately the rapid turnover of waterfowl populations that occurs during migration or cold weather movements.

It should also be noted that the majority of count data are collected between September and March, when most species of waterfowl are present in the UK in highest numbers. Data are collected during other months and have been presented (see *Data Presentation*) where relevant. However, caution is urged regarding their interpretation both due to the relative sparsity of counts from this period and the different count effort for different sites.

Information collated by WeBS and other surveys can be held or used in a variety of ways. Data may also be summarised and analysed differently depending on the requirements of the user. Consequently, calculations used to interpret data and their presentation may vary between this and other publications, and indeed between organisations or individual users. The terminology used by different organisations may not always highlight these differences. This particularly applies to summary data. Such variations do not detract from the value of each different method, but offer greater choice to users according to the different questions being addressed. This should always be borne in mind when using data presented here.

METHODS

WeBS Core Counts are made using so-called "look-see" methodology (Bibby *et al.* 1992), whereby the observer is familiar with the species involved, and surveys the whole of a predefined area (a WeBS project is underway to map precisely all current recording units).

Counts may be made at all wetland habitats, including lakes, lochs/loughs, ponds, reservoirs, gravel pits, rivers, freshwater marshes, canals, sections of open coast and, in particular, estuaries.

Numbers of the following species are recorded: divers, grebes, Cormorant, herons, Spoonbill, flamingoes, swans, geese, ducks, rail, cranes, waders and Kingfisher. Counts of gulls and terns are optional.

Species present in relatively small numbers or dispersed widely may be counted singly. The number of birds in large flocks is generally estimated by mentally dividing the birds into groups, which may vary from five to 1,000 depending on the size of the flock, and counting the number of groups. Notebooks and tally counters may be used to aid such counts.

'Priority dates' are recommended for the once monthly counts. This enables counts across the whole country to be synchronised, thus reducing the likelihood of birds being double-counted or missed. Such synchronisation is imperative where a number of counters are required to cover large sites due to the high possibility of local movements affecting count totals. Local Organisers ensure co-ordination in these cases.

The priority dates are pre-selected with a view to optimising tidal conditions for counters covering coastal sites at high tide on a Sunday (see *Coverage*). The dates used for individual sites may vary due to differences in the tidal regime around the country. Co-ordination within a site takes priority over national synchronisation.

The count nearest the priority date or, alternatively, the count co-ordinated with nearby sites if there is considered to be significant interchange, is chosen for use in this report if several accurate counts are available for the same month. A count from any date is used if it is the only one available.

Numbers presented in this report are not rounded. Site totals calculated as the sum of counts from several sectors may imply a false sense of accuracy if different count methods have been used, e.g. 5,000 birds estimated on one sector and a count of seven individuals on another is presented as 5,007. It is safe to assume that any large count includes a proportion of estimated birds. Reproducing the submitted counts in this way is deemed the most appropriate means of presentation.

Most waterfowl are readily visible. Secretive species such as snipes are generally under-recorded. No allowance is made for these habits by the observer and only birds seen or heard are recorded. The species affected by such biases are well known and the problems of interpretation are highlighted in the *Species Accounts.*

Counts suspected to be gross underestimates of the true number of non-secretive species present are specifically noted, e.g. a large flock of roosting waders only partially counted before being flushed by a predator, or a distant flock of sea-duck in heavy swell. These counts may then be treated differently, e.g. in calculating site importance (see *Species Accounts*).

Most species (or distinct sub-species) are readily identifiable during the counts. Categories, e.g. unidentified scoter species, may be used where it is not possible to be confident of identification, for example, under poor light conditions.

Observers do not receive official training, but most are experienced ornithologists and/or counters. Any particularly unusual counts are checked by the National Organisers and are confirmed with the counters if necessary.

DATA PRESENTATION

The format of data presentation follows closely that of recent reports. The recording year adopted by WeBS is from April until March of the following calendar year. The period covered comprehensively by this report comprises the entire winter (September to March for wildfowl, November to March for waders), when most counts are made. Counts of wildfowl made outwith the September to March period have been used in calculating site totals where they represent the maxima for the count year.

Following the progressive inclusion of various species or species groups in the count scheme in recent years, the amount of data considered in this report will differ for each (see e.g. *Indices*). Site assessments for most wildfowl and waders, which have been monitored for many decades, are based on counts from five years. For some others, particularly waders at inland sites, site assessments are based only on fewer years' data and, consequently, should be viewed with more caution. Recording gulls and terns is optional, and thus these data do not exist for many sites. National totals, therefore, are incomplete for these species.

Several supplementary surveys of geese and other species using non-WeBS methodology were also conducted at WeBS and other sites in 1996-97 (see *Surveys and Projects*). Data derived from sources other than the WeBS Core Counts and grey goose censuses are clearly identified throughout.

Tables 1 & 2 present total counts for all species. This enables an assessment of the true scale of WeBS monitoring with regard to particular species. In order to save space, the following abbreviations for wetland types have been used for site names in all tables:

Br.	Broad	GP(s)	Gravel pit(s)
R.	River	Est.	Estuary
Hbr	Harbour	Rsr	Reservoir
Fth	Firth	Lo.	Loch or Lough
WP	Water Park		

The location of all sites mentioned in this report are given in Appendix 2, whilst the location of key sites, including all estuaries, are also shown in Figure 3.

COVERAGE

Co-ordinated, synchronous counts are advocated to prevent double-counting or birds being missed and consequently priority dates are recommended for the monthly WeBS Core Counts.

1996-97 priority count dates:

21 April	13 October
19 May	17 November
16 June	15 December
21 July	12 January
18 August	9 February
15 September	9 March

Due to differences in tidal regimes around the country, counts at a few estuaries were made on other dates to match the most suitable conditions. Weather and counter availability also result in some counts being made on alternative dates.

Counts were received from 1,985 sites of all habitats for the count year April 1995 to March 1996, comprising 3,038 count units (the sub-divisions of large sites for which separate counts are provided). Both figures are slightly higher than in recent years.

The number of sectors counted in each country continued to rise in 1996-97, with the totals of 1,918 in England, 208 in Northern Ireland, 783 in Scotland and 247 in Wales, all higher than the respective figures in 1995-96. County totals for Lancashire (117) and Kent (107) were notable in England, with submissions from 50 or more count units in 11 further counties. County Down (83) contributed the majority of the Northern Ireland total, with Gwynedd (80) and Dyfed (75) providing a large proportion of the Welsh records. Central (144) and Strathclyde (134) were the highest Scottish counts. Totals for the Channel Islands (40) were also up on previous years.

Counts from the 1996-97 winter were not received in time for inclusion in this report from Loch Indaal, Christchurch Harbour, Loch Gruinart, Cefni Estuary, Dulas Bay, Deveron Estuary, Fleet Bay and the Spey Estuary. On the Humber Estuary, complete counts were carried out but recording forms for a large section of the estuary were not received in time for incorporation into this report. For most species, therefore, the counts made on the Humber Estuary in the 1996-97 winter are classed as incomplete.

WeBS coverage in 1996-97 is shown by 10 km squares in Figure 2. The location of each count unit is shown using only its central grid reference. Thus, for example, the 19 count sectors of the North Norfolk Marshes fall in four 10 km squares, broadly indicating the extent of the whole site. In all, WeBS count units were visited in 1,075 different 10 km squares during 1996-97, a similar total to that of recent years. As ever, areas with few wetlands or small human populations are apparent on the map as areas with little coverage. Notable differences from the picture of several years ago are the great increase in coverage in central Scotland and in Herefordshire.

The location of many of the key sites mentioned in the report and all estuaries are shown in Figure 3. The county and grid reference of all sites mentioned by name in this report are given in Appendix 2.

Figure 2. COVERAGE BY 10 KM GRID SQUARES FOR WeBS IN THE UK, ISLE OF MAN AND THE CHANNEL ISLANDS AND FOR I-WeBS IN THE REPUBLIC OF IRELAND IN 1996-97.

Small dots represent 1-2 WeBS count unit per 10 km square, medium dots represent 3-4 units and large dots represent five or more units.

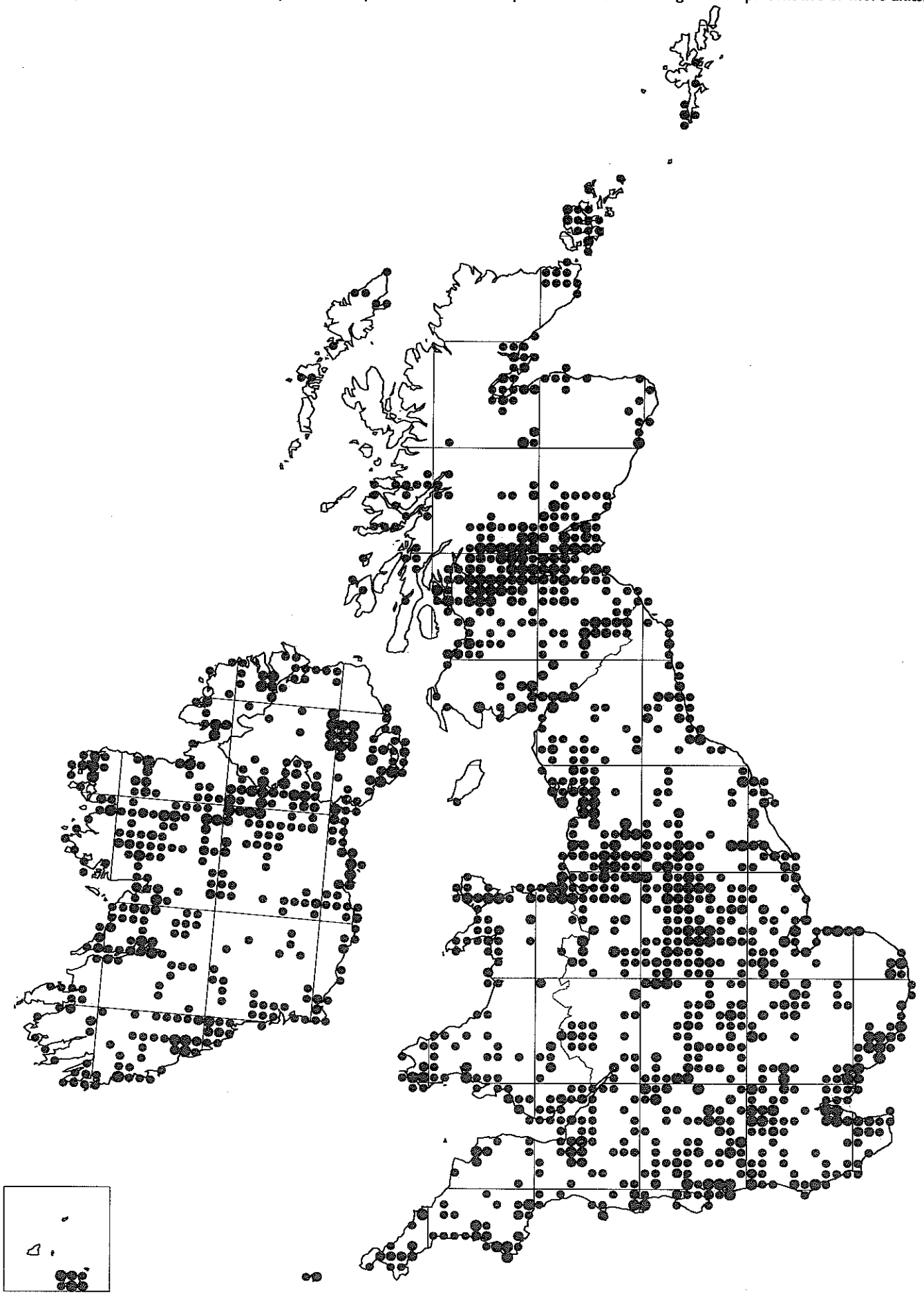

Figure 3. LOCATION OF IMPORTANT WeBS SITES

Circles show the central position of 248 important WeBS sites, including all estuaries, in the UK and the Channel Islands. Sites chosen include most internationally important sites, but also sites of regional importance in areas with few wetlands or few sites counted by WeBS. Thus, the inclusion of a site does not imply any measure of relative conservation importance. The county and grid reference for each site are given in Appendix 2.

Key

1 Loch of Spiggie
2 Loch of Boardhouse
3 Loch of Harray
4 Loch of Stenness
5 Loch Watten
6 Loch Fleet
7 Dornoch Firth
8 Loch Eye
9 Cromarty Firth
10 Inner Moray Firth
11 Loch Spynie
12 Lossie Estuary
13 Spey Estuary
14 Deveron Estuary
15 Fedderate Reservoir
16 Loch of Strathbeg
17 Haddo House Lakes
18 Ythan Estuary
19 Meikle Loch Slains
20 Corby Loch
21 Don Estuary
22 Dee (Scotland) Estuary
23 Loch of Skene
24 Dinnet Lochs
25 Loch Garten
26 Montrose Basin
27 Crombie Reservoir
28 Kinnordy Loch
29 Loch of Lintrathen
30 Tay Estuary
31 Eden Estuary
32 Cameron Reservoir
33 Ballo Reservoir
34 Loch Leven
35 Dupplin Lochs
36 Loch Clunie
37 Loch of the Lowes
38 Loch Tullybelton
39 Drummond Pond
40 Carsebreck & Rhynd Lochs
41 Carron Valley Reservoir
42 Gadloch
43 Loch Mahaick Doune
44 Lake of Menteith
45 Loch Lomond: Endrick Mouth
46 Inner Clyde Estuary
47 Castle Semple & Barr Lochs
48 Irvine/Garnock Estuary
49 Hunterston Estuary
50 Loch Quien
51 Loch Gilp
52 Loch na Cille
53 Rhunahaorine
54 Machrihanish
55 Loch Indaal
56 Loch Gruinart
57 Coll
58 Tiree
59 Loch Druidibeg
60 Cowgill Reservoirs
61 West Water Reservoir
62 Forth Estuary
63 Gladhouse Reservoir
64 Fala Flow
65 Tyninghame Estuary
66 Hule Moss
67 River Tweed: Kelso to Coldstream
68 Hoselaw Loch
69 Hirsel Lake
70 Tweed Estuary
71 Lindisfarne
72 Holborn Moss
73 Alnmouth
74 Coquet Estuary
75 Blyth (Northumberland) Estuary
76 Durham Coast
77 Tees Estuary
78 Solway Estuary
79 Castle Loch (Lochmaben)
80 Rough Firth
81 Auchencairn Bay
82 Loch Ken
83 Kirkcudbright Bay
84 Fleet Bay
85 Wigtown Bay
86 Luce Bay
87 Black & White Lochs (Loch Inch)
88 Loch Ryan
89 Bann Estuary
90 Lough Foyle
91 Upper Lough Erne
92 Loughs Neagh & Beg
93 Carlingford Lough
94 Dundrum Bay
95 Strangford Lough
96 Outer Ards Shoreline
97 Clandeboye Lake
98 Belfast Lough
99 Larne Lough
100 Irt/Mite/Esk Estuary
101 Duddon Estuary
102 Windermere
103 Morecambe Bay
104 Hay-a-Park Gravel Pits
105 Lower Derwent Valley
106 Tophill Low Reservoirs
107 Hornsea Mere
108 Humber Estuary
109 Fairburn Ings
110 Wath & Broomhill Ings
111 Rostherne Mere
112 Woolston Eyes
113 Fiddlers Ferry Lagoons
114 Mersey Estuary
115 Alt Estuary
116 Martin Mere
117 Ribble Estuary
118 Dee (Eng/Wal) Estuary
119 Clwyd Estuary
120 Colwyn Bay
121 Conwy Estuary
122 Lavan Sands
123 Red Wharf Bay
124 Dulas Bay
125 Alaw Reservoir
126 Inland Sea
127 Cefni Estuary
128 Braint Estuary
129 Foryd Bay
130 Traeth Bach
131 Artro Estuary
132 Mawddach Estuary
133 Dysynni Estuary
134 Dyfi Estuary
135 Ellesmere Group
136 Belvide Reservoir
137 Blithfield Reservoir
138 Middle Tame Valley GPs[1]
139 Draycote Water
140 Attenborough GPs
141 Swithland Reservoir
142 Pitsford Reservoir
143 Eyebrook Reservoir
144 Rutland Water
145 Baston/Langtoft GPs
146 Deeping St James Gravel Pits
147 Grafham Water
148 Little Paxton GPs
149 Fen Drayton Gravel Pit
150 Nene Washes
151 Ouse Washes
152 Lackford Gravel Pits
153 The Wash
154 North Norfolk Marshes
155 Gunton Park
156 Hickling Broad
157 St Benets Levels
158 Middle Yare Marshes
159 Berney Marshes
160 Breydon Water
161 Blyth (Suffolk) Estuary
162 Minsmere
163 Alde Complex
164 Deben Estuary
165 Orwell Estuary
166 Stour Estuary
167 Hamford Water
168 Colne Estuary
169 Abberton Reservoir
170 Blackwater Estuary
171 Dengie Flats
172 Thanet Coast
173 Pegwell Bay
174 Swale Estuary
175 Medway Estuary
176 Thames Estuary
177 Crouch/Roach Estuary
178 Hanningfield Reservoir
179 Sevenoaks Wildfowl Reserve
180 King George V Reservoir
181 Cheshunt Gravel Pits
182 Queen Mary Reservoir
183 Staines Reservoir
184 Thorpe Water Park
185 Wraysbury Gravel Pits
186 Stratfield Saye
187 Theale Gravel Pits
188 Dorchester Gravel Pits
189 Lower Windrush Valley Gravel Pits
190 Cotswold Water Park East
191 Cotswold Water Park West
192 Walmore Common
193 Severn Estuary
194 Chew Valley Lake
195 Blagdon Lake
196 Somerset Levels
197 Llandegfedd Reservoir
198 Ogmore Estuary
199 Swansea Bay
200 Burry Inlet
201 Carmarthen Bay
202 Teifi Estuary
203 Nevern Estuary
204 Cleddau Estuary
205 Taw/Torridge Estuary
206 Camel Estuary
207 Gannel Estuary
208 Hayle Estuary
209 Guernsey Shore
210 Jersey Shore
211 Helford Estuary
212 Fal Complex
213 Fowey Estuary
214 Looe Estuary
215 Tamar Complex
216 Plym Estuary
217 Yealm Estuary
218 Erme Estuary
219 Avon Estuary
220 Kingsbridge Estuary
221 Dart Estuary
222 Teign Estuary
223 Exe Estuary
224 Otter Estuary
225 Axe Estuary
226 Fleet/Wey
227 Poole Harbour
228 Mid Avon Valley
229 Christchurch Harbour
230 North-West Solent
231 Beaulieu Estuary
232 Southampton Water
233 Yar Estuary
234 Newtown Estuary
235 Medina Estuary
236 Wootton Estuary
237 Brading Harbour
238 Portsmouth Harbour
239 Langstone Harbour
240 Chichester Harbour
241 Pagham Harbour
242 Pulborough/Amberley Brooks
243 Adur Estuary
244 Newhaven Estuary
245 Cuckmere Estuary
246 Rye Harbour/Pett Levels
247 Walland Marsh
248 Dungeness Gravel Pits

[1] Site previously known as Kingsbury/Coton Pools

TOTAL NUMBERS

The total numbers of waterfowl recorded by WeBS in winter 1996-97 are given in Tables 1 & 2 for Great Britain (including the Isle of Man but excluding the Channel Isles) and Northern Ireland, respectively. Figures in these tables are derived from the WeBS Core Counts and goose censuses only. Thus, totals for certain species, e.g. some sea-ducks, are considerably under-estimated. The totals for England, Scotland, Wales, the Isle of Man and the Channel Islands are each given separately in the Appendices.

For the first time, data have been provided for all months in these tables. Coverage is less good during the summer months, as shown by the number of count units visited, and comparison with the winter period should be made with caution.

Also, numbers of waders at sites of all wetland habitats have been summed. Totals are provided for estuarine/ coastal and inland sites separately in Appendix 3. This allows comparison of coastal figures with previous reports and also provides some indication of the proportion of each species that utilises inland wetlands.

Numbers of gulls and terns are also listed, but counts are not included in the total numbers of waterfowl to allow comparison with previous reports. Further, coverage of these species was optional and thus incomplete at a national level.

Divers and grebes

Numbers of divers and grebes in 1996-97 were generally similar to or slightly lower than levels in the most recent winters. Red-throated diver numbers remained high following the record counts in 1995-96; Little and Great Crested Grebe numbers were notably lower, though the counts of the former remain well in excess of the current population estimate.

Herons and Cormorant

Although Bitterns can be difficult to observe, the particularly high count of 27 in the UK in January 1997 is likely to indicate an influx from the Continent. Total numbers of Little Egret recorded were no greater than those in 1995-96, which suggests at least a temporary halt in the spread of this immigrant. Peak numbers of Grey Heron were also similar to those in 1995-96. Cormorant numbers were markedly lower than in 1995-96, but remain above early 1990s levels.

Wildfowl

As a result of the cold weather in mid winter, 1996-97 numbers of many species, particularly those with large populations on the near continent, were some of the largest recorded by WeBS.

Mute Swan counts were the largest recorded by WeBS, whilst numbers both two yellow-billed swans were the highest since the early 1990s.

Numbers of European White-fronted Geese exceeded 7,000 for the first time in a decade, following an influx prior to the February count. Conversely, numbers of Greenland Whitefronts fell for only the second time since regular monitoring began. Icelandic Greylags continued their slow but steady decline, but both the native Scottish and naturalised populations rose to record levels. Despite continuing increases in the population, the almost 13% rise of Greenland Barnacle Geese numbers on Islay was notable, whilst Svalbard Barnacle Geese reached an all-time record. The first all-Ireland co-ordinated census of Light-bellied Brent Geese was hampered by their late arrival in the wintering grounds, but nearly the whole Svalbard population was forced over to Lindisfarne by cold weather in Denmark, resulting in double the normal numbers.

Wigeon numbers reached an all-time high in 1996-97, though counts of most other species of duck were similar to those of recent years. There was 10% decline in Teal numbers and both Pochard and Tufted Duck counts were the lowest for around a decade. The cold weather produced a marked influx of sawbills from the continent, with large counts of Smew and a phenomenal 50% increase in Goosander over the previous highest count in 1995-96. Ruddy Ducks continued to increase, with the 1996-97 total the highest yet recorded by WeBS.

Waders on estuaries and coastal wetlands

Recorded UK totals of Avocet in the winter of 1996-97 were rather higher than in 1995-96, but in that year numbers were below the average of recent years. The winter totals for all wader species combined were around the average for recent winters *i.e.* peaking around 1.7 million birds. For Golden Plover and Lapwing the reported national totals in 1996-97 were around the average value of recent winters. Both species peaked in December with sharp drops in numbers reported in January, probably the result of cold snaps in late December and early January. Dunlin and Bar-tailed Godwit, however, were recorded in above average numbers in the 1996-97 winter. Most notable during the passage periods were the very high totals reported for Little Stint (506 in the UK in September 1996) and for Curlew Sandpiper (peak of 548 also in September).

Waders on inland wetlands

During the 1996-97 winter, recorded British totals of Lapwing peaked in February at the rather low value of 91,882 birds. Golden Plover numbers were also on the low side but peaked in November at 25,952 birds. As on the tidal sites, notably high UK totals of Curlew Sandpiper and Little Stint were recorded on inland wetlands in September. These unusually high counts are unlikely to be due to increased coverage as the number of sites counted in September 1995 was not particularly high. For the

remaining wader species, recorded inland totals were not markedly different from the average of recent years.

Gulls and terns

Recording of gulls and terns remains optional during WeBS counts making interpretation of country totals very difficult. For Black-headed Gull recorded national totals were somewhat low but for the other abundant species numbers were similar to 1995-96. None of the totals reported from Northern Ireland were very different from those reported for 1995-96.

Recorded national totals of all the main tern species typically peaked in August, presumably due to an abundance of recently fledged young. Numbers of Arctic Tern and Little Tern were well below the level of 1995-96 but the other species were at a similar level. In Northern Ireland, recorded totals of Sandwich Tern were well up on the previous year but, with counting of terns being optional and most of the population concentrated in a very small number of sites, interpretation of country totals is, at best, highly speculative.

Kingfisher

The peak 1996-97 British total of 335 Kingfishers was recorded in September and is close, both in magnitude and timing, to that of the previous year.

Table 1. TOTAL NUMBERS OF WATERFOWL RECORDED BY WeBS AT ALL WETLAND HABITATS IN GREAT BRITAIN DURING 1996-97.

Wader totals for coastal and inland sites are given in Appendix 3

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Number of sites visited	*857*	*776*	*735*	*742*	*798*	*1317*	*1570*	*1592*	*1597*	*1609*	*1624*	*1548*
Number of count units visited	*1336*	*1184*	*1034*	*1093*	*1243*	*1974*	*2381*	*2403*	*2417*	*2451*	*2420*	*2305*
Red-throated Diver	148	37	33	19	17	84	144	283	519	878	393	560
Black-throated Diver	16	27	6	5	7	5	6	16	21	21	14	19
Great Northern Diver	26	9	1	2	3	1	13	59	32	47	21	25
Unidentified diver	0	0	0	0	0	1	0	1	0	0	0	0
Pied-billed Grebe	0	0	0	0	0	0	0	0	0	1	2	1
Little Grebe	1,031	655	635	1,028	1,858	3,672	3,364	3,276	2,842	2,158	1,838	1,945
Great Crested Grebe	4,037	3,121	3,161	3,799	5,555	8,209	7,364	8,115	7,332	4,809	5,206	6,011
Red-necked Grebe	24	3	4	25	17	49	32	33	41	37	23	50
Slavonian Grebe	42	1	0	1	4	20	41	93	204	136	158	234
Black-necked Grebe	11	11	3	14	9	21	15	16	46	35	31	18
Bittern	0	1	0	1	1	0	5	5	5	27	10	9
Cattle Egret	0	1	0	0	0	0	1	0	0	0	0	0
Little Egret	151	48	62	135	374	437	502	384	325	148	155	266
Grey Heron	1,377	1,344	1,639	2,228	2,464	3,666	3,256	2,764	2,790	2,243	2,520	2,068
Purple Heron	0	0	0	1	1	0	0	0	0	0	0	0
Spoonbill	1	4	4	1	0	5	2	4	4	3	2	1
Cormorant	5,903	4,118	3,415	4,800	7,829	12,667	14,132	13,488	14,158	10,248	11,939	9,357
Greater Flamingo	0	0	0	0	0	0	0	0	0	0	0	1
Lesser Flamingo	0	0	0	0	0	0	0	0	0	1	0	0
Chilean Flamingo	0	0	0	0	2	2	2	0	0	0	2	1
Mute Swan	6,832	6,193	7,666	9,141	10,468	13,815	15,814	16,570	16,263	15,513	14,071	12,291
Black Swan	17	15	4	11	21	15	14	20	13	5	9	9
Bewick's Swan	2	1	13	0	0	1	20	3,626	5,092	3,828	8,443	2,128
Whooper Swan	87	23	14	7	7	25	1,223	3,221	3,963	2,615	3,381	2,727
Swan Goose	4	13	13	13	1	26	10	7	17	18	5	20
Bean Goose	1	1	0	0	0	0	1	27	67	42	228	35
Pink-footed Goose	30,945	134	40	29	37	6,022	234,379	163,663	93,554	91,980	65,649	59,153
White-fronted Goose[1]	1	0	0	0	0	0	0	0	0	0	0	0
European Whitefront	5	3	0	1	4	2	40	696	2,577	3,831	7,029	2,528
Greenland Whitefront	47	0	0	0	0	1	12,309	20,851	16,775	13,881	14,725	19,567
Lesser White-fronted Goose	0	0	0	0	0	1	1	0	0	0	0	0
Greylag Goose:												
Icelandic	5,321	336	868	597	655	1,909	43,457	79,576	20,195	14,632	16,050	20,372
Naturalised[2]	7,300	5,633	8,054	8,690	10,619	15,109	17,295	14,449	18,642	14,170	14,197	10,109
Scottish	-	-	-	-	3,340	-	-	-	-	-	2,471	-
Bar-headed Goose	7	6	3	6	9	20	10	9	13	13	15	12
Snow Goose	34	25	38	58	33	58	99	59	64	97	58	53
Ross's Goose	1	0	0	0	0	0	2	2	2	3	1	2
Emperor Goose	0	0	1	0	1	1	0	1	1	1	2	2
Hawaiian Goose	0	0	0	0	0	1	0	0	0	0	0	0
Canada Goose	9,643	10,504	18,792	19,681	29,942	43,963	39,804	35,350	39,693	38,925	29,701	20,386
Barnacle Goose	13,568	4,421	98	164	151	481	45,404	50,084	56,007	47,793	37,089	44,187
Brent Goose[1]	0	0	0	1	0	0	0	2	9	0	1	12
Dark-bellied Brent	4,802	7,990	16	30	30	1,732	45,065	73,086	93,677	91,582	87,160	63,363
Black Brant	0	0	0	0	0	0	0	0	0	1	0	1
Light-bellied Brent	8	0	0	0	1	359	1,081	2,346	2,696	4,389	1,899	484
Red-breasted Goose	0	0	0	0	0	0	0	1	1	0	0	2
Egyptian Goose	36	25	41	43	72	196	166	126	121	116	99	37
Feral/hybrid Goose	43	43	42	44	33	203	499	237	169	156	193	299
Unidentified Goose	0	0	0	0	0	0	0	50	0	0	0	0
Ruddy Shelduck	3	1	1	6	7	5	1	7	4	2	6	3
Cape Shelduck	0	0	1	0	0	0	0	0	0	0	1	0
Paradise Shelduck	1	1	0	0	0	1	1	1	1	1	1	0
Shelduck	31,998	18,726	14,695	12,104	17,226	21,628	34,848	42,100	58,356	79,186	69,754	48,789
Muscovy Duck	19	19	16	16	18	87	70	134	137	105	90	35
Wood Duck	1	1	1	1	1	1	2	3	1	3	1	3
Mandarin	77	77	89	121	117	142	227	186	205	162	179	166
Wigeon	3,415	248	176	212	713	58,043	189,205	217,865	333,173	405,562	339,155	156,637
American Wigeon	1	0	0	0	0	0	5	1	4	2	6	4
Chiloe Wigeon	0	1	0	0	2	0	1	0	2	0	0	0
Gadwall	2,097	1,280	1,427	701	2,484	5,770	7,883	10,171	10,484	8,477	9,332	5,828
Teal	7,613	470	319	1,088	8,000	58,446	84,231	96,492	119,674	112,060	94,553	50,319
Speckled Teal	1	0	0	0	0	0	0	0	0	0	0	0

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Mallard	24,065	21,239	30,447	37,902	68,340	114,902	131,070	133,215	145,567	146,694	98,406	57,121
Black Duck	0	0	0	0	0	0	1	0	0	1	1	0
Pintail	536	32	9	5	21	5,320	12,478	21,052	27,628	25,158	21,924	6,786
Bahama Pintail	0	0	0	0	0	0	1	0	1	0	0	0
Red-billed Teal	0	0	0	0	0	0	0	1	1	0	0	0
Garganey	27	22	8	17	51	42	8	0	0	0	0	2
Blue-winged Teal	0	0	0	0	0	2	0	0	0	0	0	0
Shoveler	2,199	384	292	325	2,301	7,482	9,007	8,317	7,668	5,135	6,313	6,531
Maned Duck	0	0	1	0	1	0	0	0	0	0	0	0
Red-crested Pochard	4	1	0	5	4	17	30	20	75	37	62	62
Pochard	1,230	617	826	2,453	6,230	12,290	17,668	29,804	31,117	31,880	34,083	15,992
Redhead	0	0	0	0	0	0	0	0	0	0	1	0
Ring-necked Duck	0	0	1	0	1	0	2	0	1	1	0	1
Tufted Duck	16,346	8,686	7,279	18,226	26,347	40,158	38,085	46,347	47,370	46,905	46,557	37,010
Scaup	710	32	5	7	7	355	595	885	2,771	5,806	2,830	3,500
Lesser Scaup	1	0	0	0	0	0	0	1	0	2	1	1
Eider	16,277	14,650	19,950	22,429	21,161	24,625	20,521	20,179	24,598	25,420	21,999	21,451
King Eider	1	1	0	0	0	0	0	1	0	0	0	0
Long-tailed Duck	179	125	0	0	0	1	163	649	1,966	1,321	1,149	1,008
Common Scoter	3,915	518	301	651	1,266	1,505	2,614	3,180	3,506	5,546	4,805	3,832
Surf Scoter	5	1	0	0	0	0	1	4	3	3	3	3
Velvet Scoter	686	258	135	216	164	205	355	1,068	742	568	319	868
Goldeneye	2,233	168	80	128	101	118	506	7,550	14,504	16,893	17,834	13,341
Hooded Merganser	0	0	0	0	0	0	0	1	1	1	1	1
Smew	2	0	0	0	0	0	0	13	49	412	410	127
Red-breasted Merganser	1,509	555	466	536	1,142	1,790	3,188	3,108	4,276	3,620	3,494	2,914
Goosander	392	358	188	535	684	787	1,395	1,803	3,431	6,554	5,430	3,077
Ruddy Duck	1,205	684	425	567	1,086	2,001	2,137	2,872	2,611	3,625	2,534	2,679
Feral/hybrid Mallard type	92	93	70	75	93	103	142	84	104	98	72	92
Hybrid Aythya	1	0	0	0	0	1	0	1	0	1	1	0
Unidentified duck	0	0	0	0	0	0	0	0	0	2	0	0
Water Rail	72	43	41	36	52	86	152	254	324	241	228	194
Spotted Crake	1	0	0	0	0	2	0	0	0	0	0	0
Moorhen	4,593	3,494	3,062	4,313	5,776	10,075	9,815	10,896	11,738	10,846	9,349	9,166
Coot	17,588	13,743	17,700	30,390	50,299	78,448	88,651	96,094	95,265	89,436	73,011	46,552
Crane	2	0	0	0	0	0	0	0	0	0	5	0
Oystercatcher	46,582	34,133	26,380	67,906	157,963	207,228	259,852	221,491	265,930	252,486	251,061	157,064
Black-winged Stilt	0	0	0	0	0	1	0	0	1	0	0	0
Avocet	507	228	174	626	1,185	1,855	1,348	2,630	2,651	1,504	1,625	940
Little Ringed Plover	232	250	245	216	92	23	7	0	0	0	0	1
Ringed Plover	5,720	9,038	1,174	1,676	18,166	14,606	12,987	8,134	9,404	7,015	7,767	3,821
Kentish Plover	0	0	0	0	0	0	0	0	1	1	1	1
Golden Plover	2,749	54	24	3,117	11,621	34,847	73,123	71,608	121,517	21,850	57,032	26,244
Grey Plover	9,477	6,245	247	1,067	22,806	34,173	41,340	30,714	49,239	47,081	48,567	32,533
Lapwing	5,744	3,769	10,048	30,801	55,566	70,711	123,923	188,386	304,350	64,618	219,013	37,324
Great Knot	0	0	0	0	0	0	1	0	0	0	0	0
Knot	66,277	6,861	4,799	17,645	82,592	93,118	106,866	142,823	187,375	239,862	255,495	126,441
Sanderling	2,287	12,038	494	7,176	9,985	8,497	8,073	6,355	8,475	7,751	8,390	5,573
Little Stint	0	10	4	3	32	840	375	35	22	2	1	1
Baird's Sandpiper	0	0	0	0	0	1	0	0	0	0	0	0
Pectoral Sandpiper	0	0	0	0	0	1	4	0	0	0	0	0
Curlew Sandpiper	1	4	1	22	70	735	264	26	3	0	0	0
Purple Sandpiper	340	17	0	10	49	89	202	698	1,019	823	842	859
Dunlin	77,273	60,339	546	41,383	62,428	107,555	218,287	321,301	458,873	541,534	519,302	226,093
Buff-breasted Sandpiper	0	0	0	0	1	0	0	0	0	0	0	0
Ruff	80	20	3	121	478	514	282	311	449	211	419	424
Jack Snipe	14	0	0	0	0	7	51	124	99	55	54	59
Snipe	500	75	61	140	985	2,467	3,604	5,509	5,346	2,613	2,538	2,678
Woodcock	2	2	3	1	0	2	7	26	58	84	68	16
Black-tailed Godwit	3,475	782	1,119	6,660	11,304	18,024	13,274	11,875	10,680	11,368	13,351	19,815
Bar-tailed Godwit	1,681	1,378	497	11,890	20,254	22,955	26,137	21,178	38,619	72,821	81,460	21,036
Whimbrel	635	690	15	733	799	142	70	5	5	3	6	19
Curlew	11,486	3,336	6,588	50,319	76,205	88,063	82,275	56,408	68,709	50,686	78,087	64,896
Spotted Redshank	28	5	8	113	282	335	217	66	74	65	70	58
Redshank	17,643	2,120	2,457	19,875	44,401	70,937	78,306	67,129	72,151	65,836	65,953	59,316
Greenshank	109	70	15	592	1,461	1,792	1,098	233	180	118	129	175
Lesser Yellowlegs	1	0	0	0	0	0	0	0	0	0	0	0

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Green Sandpiper	40	4	15	242	454	287	167	93	80	54	71	70
Wood Sandpiper	1	6	0	6	60	10	6	2	1	1	0	0
Common Sandpiper	377	474	262	845	1,199	389	61	29	23	8	11	16
Spotted Sandpiper	1	1	0	0	0	0	0	0	0	0	0	0
Turnstone	4,615	1,388	210	888	5,438	8,010	11,745	9,897	13,067	11,954	10,452	9,209
Grey Phalarope	0	0	0	0	0	0	0	0	1	0	0	0
TOTAL WILDFOWL[3]	223,134	125,758	137,557	176,474	276,589	540,440	1,122,731	1,230,310	1,328,006	1,383,479	1,174,057	760,737
TOTAL WADERS	257,877	143,337	55,389	264,073	585,876	788,214	1,063,952	1,167,086	1,618,402	1,400,404	1,621,765	794,682
TOTAL WATERFOWL[4]	481,011	269,095	192,946	440,547	862,465	2,451,385	1,063,952	2,397,396	2,946,408	2,783,883	2,795,822	1,555,419

Gulls[5]

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Number of sites counted	*635*	*608*	*585*	*626*	*658*	*1,088*	*1,273*	*1,306*	*1,287*	*1,286*	*1,290*	*1,234*
Mediterranean Gull	11	6	6	28	26	64	32	26	38	26	50	39
Laughing Gull	0	0	0	0	0	1	0	0	0	0	0	0
Little Gull	266	32	6	105	27	53	2	10	0	3	4	10
Black-headed Gull	40,563	29,347	23,364	77,601	119,433	148,336	171,895	142,315	196,036	208,203	178,459	160,691
Ring-billed Gull	1	0	0	0	1	0	0	0	3	2	1	2
Common Gull	3,563	2,816	3,024	5,875	18,466	17,529	39,099	28,737	58,856	70,265	48,046	38,329
Lesser Black-backed Gull	40,090	31,767	33,673	26,868	15,032	16,189	12,380	17,272	9,461	6,694	23,184	21,744
Herring Gull	29,313	30,456	32,213	35,906	43,687	41,476	40,039	39,478	66,070	60,022	54,207	49,847
Iceland Gull	2	2	0	1	0	0	0	1	2	7	7	5
Glaucous Gull	0	0	0	0	0	0	1	5	10	15	19	8
Great Black-backed Gull	1,386	1,201	1,957	3,012	4,383	6,185	12,282	7,916	10,122	10,074	4,406	3,197
Kittiwake	121	545	8,902	213	1,333	670	72	25	35	20	185	419
TOTAL GULLS	115,316	96,172	103,145	149,609	202,388	230,503	275,802	235,785	340,633	355,331	308,568	274,291

Terns[5]

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Number of sites counted	*636*	*621*	*599*	*624*	*647*	*945*	*1,080*	*1,091*	*1,109*	*1,131*	*1,116*	*1,036*
Gull-billed Tern	0	0	0	1	0	0	0	0	0	0	0	0
Sandwich Tern	1,248	3,259	3,072	2,688	7,976	2,601	67	2	0	0	0	1
Roseate Tern	4	2	1	4	0	1	0	0	0	0	0	0
Common Tern	554	2,113	2,360	3,155	4,812	842	21	2	0	0	0	0
Arctic Tern	173	359	484	427	190	15	1	2	0	0	0	0
Little Tern	12	341	578	824	955	29	0	0	0	0	0	0
Black Tern	50	42	0	0	74	2	0	0	0	0	0	0
Unidentified Tern	23	19	1	38	11	7	0	0	0	0	1	0
TOTAL TERNS	2,064	6,135	6,496	7,137	14,018	3,497	89	6	0	0	1	1

Kingfisher

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Kingfisher	59	63	49	85	156	335	270	268	233	132	110	119

Counts include data from the following goose censuses: national census of Pink-footed and Greylag Geese in October and November; international censuses of Greenland White-fronted Geese in November/December and March/April, with counts from main resorts in other months; November and January censuses of Greenlandic Barnacle Geese on Islay. See Surveys and Projects *for more details.*

1 *Indicates White-fronted and Brent Geese which were not identified to subspecies*

2 *In all months except September, the naturalised component of this species is approximated by totalling counts from English (excluding Northumberland) and Welsh sites only and adding 2,340 (after Delany 1992) for the re-established birds in Scotland. All other birds in Great Britain (apart from the native population in the Outer Hebrides, Coll, Tiree, Colonsay and parts of Sutherland) are considered to be from the Icelandic population*

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

4 *Total waterfowl represents numbers of all wildfowl (as above), waders and herons*

5 *Counting gulls and terns was optional, and thus totals are incomplete at a national level*

Separate totals are provided for waders counted on estuarine/coastal sites and on inland sites in Appendix 3.

Table 2. TOTAL NUMBERS OF WATERFOWL RECORDED BY WeBS AT ALL WETLAND SITES IN NORTHERN IRELAND DURING 1996-97.

Wader totals for coastal and inland sites are given in Appendix 3

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Number of sites visited	*3*	*4*	*3*	*3*	*4*	*14*	*29*	*35*	*42*	*43*	*34*	*38*
Number of count units visited	*15*	*117*	*11*	*12*	*114*	*132*	*133*	*155*	*198*	*192*	*187*	*188*
Red-throated Diver	7	0	0	0	0	0	0	38	21	9	9	7
Black-throated Diver	0	0	0	0	0	0	0	0	2	1	0	0
Great Northern Diver	10	0	0	0	0	0	0	10	0	0	2	0
Little Grebe	1	42	0	3	308	507	567	379	509	596	216	217
Great Crested Grebe	18	788	0	18	1,642	2,036	279	1,427	2,003	1,591	1,314	995
Slavonian Grebe	24	0	0	0	0	0	0	20	2	3	1	0
Grey Heron	16	85	28	36	245	328	223	197	196	175	144	76
Cormorant	155	485	119	83	1,096	1,381	937	897	1,454	1,380	954	905
Mute Swan	166	1,095	76	56	1,897	1,963	1,725	1,130	2,067	2,254	1,236	1,970
Bewick's Swan	0	0	0	0	0	0	0	20	154	366	154	121
Whooper Swan	30	0	0	0	5	8	1,110	752	2,098	2,461	1,254	3,137
Pink-footed Goose	0	0	0	0	0	0	0	0	9	1	0	28
Greenland Whitefront	42	0	0	0	0	0	26	4	210	297	32	38
Greylag Goose[1]	37	0	0	0	0	95	235	168	516	493	755	674
Canada Goose	0	0	0	0	0	1	247	176	720	830	259	338
Barnacle Goose	0	0	0	0	0	5	123	124	126	129	122	100
Light-bellied Brent	42	3	0	0	0	110	16,393	14,605	5,073	3,473	3,671	2,678
Shelduck	290	330	81	29	25	279	367	1,207	1,765	5,103	3,580	1,797
Mandarin	0	1	0	0	0	2	0	0	0	0	0	0
Wigeon	65	35	0	0	5	996	10,280	7,486	6,536	6,487	4,895	4,703
Gadwall	0	44	0	0	81	189	224	156	208	104	141	172
Teal	52	73	0	0	246	1,368	1,664	2,934	4,649	4,035	2,968	1,860
Mallard	103	1,057	247	180	6,418	8,493	7,254	5,024	4,901	5,823	2,736	1,849
Pintail	8	0	0	0	1	10	107	170	95	267	249	53
Shoveler	0	2	0	0	2	81	140	168	187	138	124	134
Pochard	0	135	0	0	1,007	722	4,229	7,655	25,711	17,128	10,522	2,801
Tufted Duck	0	1,516	0	0	4,345	2,466	14,109	12,245	27,897	13,528	13,359	10,576
Scaup	0	101	0	0	0	1	7	1,340	1,490	1,728	1,763	4,222
Eider	0	76	321	401	452	373	21	943	889	258	947	384
Long-tailed Duck	0	0	0	0	0	0	1	0	0	5	27	0
Common Scoter	0	0	0	0	0	0	0	2	0	1	0	0
Velvet Scoter	0	0	0	0	0	0	1	0	0	0	0	0
Goldeneye	20	124	4	0	40	189	229	3,951	6,708	4,661	3,731	8,886
Smew	0	0	0	0	0	0	0	0	0	2	1	4
Red-breasted Merganser	98	37	18	53	155	347	232	594	327	324	430	426
Ruddy Duck	0	5	0	0	24	48	40	22	89	57	23	18
Unidentified duck	0	0	0	0	0	0	0	0	2	0	0	0
Water Rail	0	0	0	0	0	0	0	0	4	3	1	2
Moorhen	2	54	1	0	107	150	298	188	326	251	62	295
Coot	0	730	0	0	3,273	8,695	4,845	2,904	5,344	4,440	2,583	2,947
Oystercatcher	1,056	203	269	1,442	3,632	13,664	9,365	14,378	15,711	16,108	17,328	7,005
Ringed Plover	17	3	13	33	125	343	279	1,052	667	578	770	113
Golden Plover	2,756	0	0	0	0	912	9,462	10,189	28,975	21,029	19,651	6,836
Grey Plover	0	0	0	0	0	35	157	78	176	507	592	176
Lapwing	161	41	85	215	1,495	1,795	5,064	5,875	31,402	31,699	20,331	1,631
Knot	320	17	0	1	3	9	84	3,285	8,007	11,040	13,108	269
Sanderling	0	0	0	0	7	19	13	48	77	163	68	94
Little Stint	0	0	0	0	0	9	0	0	0	0	0	0
Curlew Sandpiper	0	0	0	0	0	20	13	0	0	0	0	0
Purple Sandpiper	0	0	0	0	0	2	0	60	91	105	92	89
Dunlin	206	191	9	46	412	1,037	2,402	9,105	19,449	21,113	22,323	7,265
Ruff	1	0	0	0	2	7	1	0	0	0	0	0
Jack Snipe	0	0	0	0	0	0	0	1	1	3	0	2
Snipe	0	1	0	0	20	24	47	99	187	134	134	189
Woodcock	0	0	0	0	0	0	0	0	1	0	0	0
Black-tailed Godwit	4	0	2	18	13	891	116	102	593	293	474	25

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Bar-tailed Godwit	236	0	0	0	42	262	996	409	1,283	3,329	3,714	779
Whimbrel	8	7	1	0	6	5	1	0	0	0	0	0
Curlew	761	138	214	1,723	3,371	5,231	3,270	3,472	4,399	5,632	6,605	4,681
Spotted Redshank	2	0	0	0	0	1	0	1	2	2	1	1
Redshank	814	42	5	459	1,215	5,784	4,540	7,187	7,270	6,293	7,129	5,141
Greenshank	2	0	0	14	43	67	84	59	63	53	56	47
Common Sandpiper	0	0	0	4	2	2	0	0	0	0	0	0
Turnstone	7	2	1	1	38	695	370	1,644	1,783	1,688	1,624	1,173
Wilson's Phalarope	0	0	0	0	0	1	0	0	0	0	0	0
TOTAL WILDFOWL[2]	1,170	6,733	867	823	21,129	30,515	65,690	66,739	102,092	78,227	58,121	52,337
TOTAL WADERS	6,351	645	599	3,956	10,426	30,815	36,264	57,044	120,137	119,769	114,000	35,516
TOTAL WATERFOWL[3]	7,521	7,378	1,466	4,779	31,555	61,330	101,954	123,783	222,229	197,996	172,121	87,853

Gulls[4]

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Number of sites counted	*2*	*3*	*2*	*3*	*4*	*7*	*13*	*15*	*17*	*18*	*15*	*14*
Mediterranean Gull	0	0	0	1	0	0	0	1	0	0	0	1
Bonaparte's Gull	0	0	0	0	0	0	0	1	0	0	0	0
Black-headed Gull	237	4,394	328	1,799	6,583	13,150	7,768	5,285	10,750	10,072	7,394	8,560
Common Gull	69	39	75	214	1,551	2,956	1,571	819	1,573	1,797	2,309	1,703
Lesser Black-backed Gull	102	84	5	6	659	1,145	269	24	24	103	65	162
Herring Gull	195	227	147	257	573	4,775	968	5,020	1,813	1,944	1,556	1,245
Iceland Gull	0	0	0	0	0	0	0	1	1	1	0	0
Glaucous Gull	1	0	0	0	0	0	0	0	0	1	2	0
Great Black-backed Gull	40	204	83	130	205	701	257	666	300	242	627	201
Kittiwake	0	0	0	0	0	84	18	0	2	0	1	3
TOTAL	644	4,948	638	2,407	9,571	22,811	10,851	11,817	14,463	14,160	11,954	11,875

Terns[4]

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Number of sites counted	*2*	*3*	*1*	*3*	*4*	*5*	*8*	*6*	*5*	*5*	*4*	*4*
Sandwich Tern	10	12	0	185	218	417	2	0	0	0	0	0
Common Tern	0	62	0	3	17	2	0	0	0	0	0	0
Unidentified Tern	0	0	0	0	0	10	0	0	0	0	0	0
TOTAL	10	74	0	188	235	429	2	0	0	0	0	0

Kingfisher

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Number of sites counted	*3*	*4*	*3*	*3*	*4*	*14*	*29*	*35*	*42*	*42*	*33*	*36*
Kingfisher	0	0	0	0	1	2	1	0	0	2	1	0

UK TOTALS

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Wildfowl[2]	224,304	132,491	138,424	177,297	294,378	570,955	1,188,421	1,297,049	1,430,098	1,461,706	1,229,707	813,074
Waders	264,228	143,982	55,988	268,029	596,302	819,029	1,100,216	1,224,130	1,738,539	1,520,173	1,735,765	830,198
Waterfowl[3]	488,532	276,473	194,412	445,326	890,680	1,389,984	2,288,637	2,521,179	3,168,637	2,981,879	2,965,472	1,643,272
Gulls[4]	115,960	101,120	103,783	152,016	211,959	253,314	286,653	247,602	355,096	369,491	320,522	286,166
Terns[4]	2,074	6,209	6,496	7,325	14,253	3,926	91	6	0	0	1	1
Kingfisher	59	63	49	85	157	337	271	268	233	134	111	119

1 *It is not possible to separate birds from the naturalised and Icelandic populations in Northern Ireland*
2 *Total wildfowl represents numbers of all divers, grebes, Cormorant, swans, geese, ducks and rails*
3 *Total waterfowl represents numbers of all wildfowl (as above), waders and herons*
4 *Counting gulls and terns was optional, and thus totals are incomplete at a national level*

MONTHLY FLUCTUATIONS

The vast majority of the wintering populations of most wader species is found on estuaries. Coverage of estuaries by WeBS remained at a relatively high and more or less constant level throughout winter 1996-97, enabling meaningful comparisons of total monthly counts to be made for many species. However, the number of sites of different habitats counted in each month can differ quite widely. Since wildfowl are more widely distributed across both inland and coastal habitats than waders, changes in monthly count totals given in Tables 1 & 2 may not necessarily reflect true changes in relative abundance during the season. Also, the presentation of data for seven months, which includes the migratory periods for some species, means that there are real fluctuations in total numbers of wildfowl during the period considered in this report.

These fluctuations may be examined by using only counts from sites covered in all seven months (September to March). Totals calculated for each month from these sites only can then be compared directly (expressed as a percentage of the maximum numbers), thus revealing patterns of seasonality for the species considered. The 1996-97 figures are given in Tables 3 & 4 for Great Britain and Northern Ireland separately, with averages from the last five seasons for comparison. Non-migratory, scarce and irregularly counted species are omitted and only WeBS Core Counts have been used in this calculation. Caution should be used in interpreting figures for species which only occur in small numbers (see Tables 1 & 2). Thus, numbers tend to fluctuate more widely for many species in Northern Ireland, largely as a result of the smaller numbers of birds involved but also, being at the westernmost limit of their range, due to variable use being made of Ireland by wintering wildfowl.

Broad differences in the monthly values between species reflect their status in the UK. Resident species, or those with large UK breeding populations, such as the grebes, Mallard and, to a certain extent, Gadwall, are present in large numbers early in the winter. Declines through the winter result in part from mortality of first year birds, but also birds returning to remote or small breeding sites that are not covered by WeBS. The majority of UK wildfowl either occur solely as winter visitors, or have small breeding populations that are swelled by winter immigrants, with peak abundance generally occurring in mid winter.

Table 3. PROPORTIONS IN EACH MONTH OF THE PEAK WINTER POPULATION OF CERTAIN WILDFOWL AND ALLIES PRESENT ON 1,359 BRITISH SITES THAT WERE COUNTED IN ALL SEVEN MONTHS OF 1996-97.

Bracketed figures give averages for the 1991-92 to 1995-96 period.

	Sep		Oct		Nov		Dec		Jan		Feb		Mar	
Little Grebe	100	(99)	83	(95)	74	(82)	62	(74)	45	(62)	40	(60)	45	(56)
Great Crested Grebe	100	(100)	84	(96)	85	(88)	79	(77)	58	(70)	56	(72)	64	(76)
Cormorant	100	(93)	95	(99)	85	(90)	92	(89)	74	(84)	80	(86)	58	(76)
Bewick's Swan	0	(0)	0	(1)	46	(38)	64	(78)	41	(93)	100	(83)	19	(11)
Whooper Swan	1	(1)	17	(25)	82	(86)	100	(88)	63	(89)	91	(90)	79	(74)
European Whitefront	0	(0)	1	(1)	12	(10)	55	(32)	74	(73)	100	(83)	30	(42)
Dark-bellied Brent	1	(2)	53	(43)	87	(85)	100	(90)	94	(93)	93	(91)	65	(64)
Shelduck	28	(30)	51	(63)	57	(83)	75	(91)	100	(98)	86	(91)	64	(79)
Wigeon	13	(11)	39	(48)	54	(78)	73	(97)	100	(93)	84	(74)	39	(44)
Gadwall	58	(79)	74	(82)	95	(97)	100	(99)	86	(87)	87	(75)	69	(49)
Teal	51	(48)	73	(66)	90	(88)	98	(100)	100	(91)	81	(68)	46	(40)
Mallard	88	(93)	93	(94)	91	(96)	100	(99)	99	(88)	68	(61)	43	(37)
Pintail	14	(25)	29	(74)	81	(75)	100	(91)	88	(92)	71	(67)	25	(24)
Shoveler	91	(83)	100	(91)	90	(95)	85	(84)	58	(70)	71	(70)	68	(63)
Pochard	27	(35)	40	(62)	76	(87)	78	(93)	96	(99)	100	(89)	45	(39)
Tufted Duck	80	(87)	75	(82)	92	(93)	95	(99)	100	(91)	91	(83)	77	(73)
Goldeneye	1	(2)	2	(14)	48	(53)	81	(81)	100	(90)	96	(100)	83	(85)
Goosander	14	(29)	13	(41)	25	(53)	52	(83)	100	(96)	89	(92)	49	(66)
Coot	87	(93)	97	(94)	97	(94)	100	(93)	86	(82)	75	(62)	49	(45)

Table 4. PROPORTIONS IN EACH MONTH OF THE PEAK WINTER POPULATION OF CERTAIN WILDFOWL AND ALLIES PRESENT ON 90 NORTHERN IRELAND SITES THAT WERE COUNTED IN ALL SEVEN MONTHS OF 1996-97.

Bracketed figures give averages for the 1991-92 to 1995-96 period.

	Sep		Oct		Nov		Dec		Jan		Feb		Mar	
Little Grebe	86	(85)	100	(93)	66	(78)	81	(65)	87	(59)	35	(38)	24	(24)
Great Crested Grebe	100	(94)	44	(71)	49	(37)	46	(32)	22	(47)	36	(34)	80	(64)
Cormorant	79	(99)	100	(82)	59	(66)	73	(58)	51	(46)	35	(52)	57	(46)
Bewick's Swan	0	(0)	0	(13)	14	(41)	41	(58)	100	(80)	94	(92)	14	(35)
Whooper Swan	1	(0)	100	(71)	62	(81)	87	(62)	95	(83)	78	(73)	83	(72)
Light-bellied Brent	1	(49)	100	(100)	89	(57)	31	(38)	19	(30)	20	(23)	14	(19)
Shelduck	6	(5)	8	(16)	26	(50)	35	(82)	100	(95)	63	(83)	38	(64)
Wigeon	9	(42)	100	(87)	72	(69)	48	(66)	47	(58)	44	(53)	34	(33)
Gadwall	88	(84)	100	(76)	92	(75)	96	(67)	45	(76)	80	(56)	85	(66)
Teal	31	(41)	39	(69)	77	(78)	100	(94)	86	(75)	66	(71)	35	(37)
Mallard	100	(98)	100	(93)	73	(66)	51	(64)	66	(49)	34	(33)	20	(19)
Pintail	3	(7)	40	(50)	64	(77)	35	(88)	100	(72)	94	(54)	17	(21)
Shoveler	48	(45)	97	(67)	87	(98)	100	(87)	69	(66)	63	(65)	60	(52)
Pochard	3	(8)	16	(29)	35	(68)	100	(72)	54	(90)	27	(35)	9	(7)
Tufted Duck	10	(29)	60	(73)	86	(84)	100	(82)	62	(92)	48	(69)	37	(44)
Scaup	0	(0)	0	(19)	47	(25)	40	(33)	42	(46)	28	(69)	100	(85)
Goldeneye	1	(2)	5	(13)	74	(56)	60	(69)	50	(93)	50	(76)	100	(61)
Coot	100	(88)	97	(94)	56	(79)	57	(81)	56	(44)	41	(38)	37	(25)

INDICES

Because the same WeBS sites are not necessarily covered each year, changes in waterfowl population sizes cannot be determined simply by comparing the total number of birds counted in each year. Consequently, indexing techniques have been developed which allow between year comparisons of populations, even if the true population size is unknown. A new technique developed specifically for waterbird populations, the 'Underhill index' (Underhill 1989), has been adopted for use in this report.

A full explanation of this indexing process and its application for major waterfowl populations in the UK is given in Pr s-Jones *et al.* (1994), Underhill & Pr s-Jones (1994) and Kirby *et al.* (1995). In summary, the index calculates missing counts, i.e. when the site was not counted, using a formula that assumes that a count of a species at any site in any month and year can be represented by the combination of a site factor, a month factor and a year factor. This allows the 'holes' in the data to be filled and effectively means that data are available for the same set of sites in each year. The new total counts are thus directly comparable from one year to the next and the changes in the population can be calculated.

It should be borne in mind that the missing values are calculated anew each year. Because the index formula uses data from all years, each new year's counts will slightly alter the site, month and year factors. In turn, the missing counts may differ slightly and, as a result, the index values published each year are likely to differ from those published in the previous *Wildfowl and Wader Counts*. The indices published here represent an improvement on previous figures as the additional year's data allow calculation of the site, month and year factors with greater confidence.

Underhill (1989) recommends that, where possible, the index is based on counts from more than one month. The months chosen for each species are given in the footnote below. The most appropriate grouping of months on which to base the annual index for waders is December, January and February, the period when the wintering population in Britain and Northern Ireland is most stable (Pr s-Jones *et al.* 1994). However, the peak abundance of different wildfowl occur in different months according to species, and thus different months and different numbers of months were selected for each (Kirby *et al.* 1995).

Not all species are included in the indexing process. Notably, many of the goose populations are excluded, partly because their reliance on non-wetland sites requires different count methodologies, but also because regular censusing of substantially the whole of the British populations negates the need for an index to be calculated using the Underhill technique. Thus, the indices for Pink-footed, Icelandic Greylag, Greenland White-fronted and Svalbard Barnacle Geese have been derived from the highest total count obtained during censuses of the population in each year (see *Surveys and Projects*). Many sea-ducks are also excluded from the indexing process because of the extreme censusing difficulties involved. Waders excluded from the index include those for which large numbers occur away from wetlands, e.g. Lapwing and Golden Plover, and those that are difficult to count accurately using WeBS methods, e.g. Snipe and Jack Snipe. Waterfowl species which only occur in small numbers in Britain and Ireland have also been excluded.

Index values for wildfowl species in Britain and Northern Ireland have been provided separately. However, index values calculated for the populations of waders in Northern Ireland were found to be statistically unreliable due to the small number of estuaries contributing to each index value. It was therefore decided to combine the Northern Ireland data with that for Great Britain to produce UK indices for waders.

Figures 4-8 plot indices for all waterfowl for which values have been calculated. The index values for the most recent five years are presented in the *Species Accounts* to indicate recent changes in the population.

The size of the species population has been constrained to equal 100 in the base year (1970-71 for wildfowl in Great Britain, 1987-88 for wildfowl in Northern Ireland, and 1972-73 for waders). Underhill index values presented in the figures are derived from sites where at least 50% of the maximum possible number of counts, bearing in mind that different months are used for different species, were complete. Index values provided extend back to 1966-67 for wildfowl and 1971-72 for waders, representing the first years in which coverage was deemed sufficient for data to be included in the calculation of the index. A number of species were only first included in WeBS in the 1980s, whilst counts of wildfowl in Northern Ireland only began in earnest in 1985-86. For simplicity, the base year adopted for the recently monitored species in Great Britain and for all wildfowl in Northern Ireland is 1987-88 (see footnote for details). It should be reiterated that, since comparatively few years' data are available for these newly monitored species, their index values should be viewed with caution, especially in Northern Ireland where only a relatively small number of sites contribute to the index values. Many of these index values have comparatively large consistency intervals (which provide a measure of confidence in the accuracy of the index but are not presented here for clarity). Since the Underhill technique uses data from all available years to calculate index values, future data will refine the index values further.

For all species, the long-term trends in index values can be used with confidence to assess changes in overall wintering populations. Because short-term fluctuations provide a less rigorous indication of population changes, care should be taken in their interpretation.

Wildfowl and allies

Interpretation of the additional year's index values provided for the first time in this report are inevitably speculative to some extent, as increases or decreases may relate only to temporary factors or natural fluctuations, or indicate interchange with other countries, especially during particularly cold or mild weather. Nevertheless, consistent trends over the most recent five years provide a degree of confidence that real long-term changes may be occurring, whilst values for individual years may reflect more accurately particular short-term changes than the total counts.

Index values for most wildfowl species were consistent with trends noted in recent years. The index for Whooper Swan increased significantly though the value for Bewick's Swan remained relatively unchanged. Feral goose populations continued to rise whilst the fall in the Mallard population index continued. Cold weather movements from continental Europe probably accounted for the increase in values for several species, notably Goosander. Great Britain population for the following species changed by 20% or more between 1995-96 and 1996-97: Whooper Swan (+42%), Goldeneye (+45%), Goosander (+23%) and Ruddy Duck (+21%).

Waders

In the winter of 1996-97 many wader species recorded large increases in index values compared to the previous year (Figures 7 and 8). A decline in the winter index from the previous winter exceeding 10% was recorded only for Ringed Plover, for which the index dropped by 14%. Amazingly the winter index reached an all time high for four species: Grey Plover (10% increase from the previous winter), Black-tailed Godwit (28% increase), Bar-tailed Godwit (40% increase) and Sanderling (63% increase). The first two of these species have been exhibiting an upward long-term trend for many years. Bar-tailed Godwit are known to emigrate from continental Europe during severe winter weather and settle in the comparatively mild UK. During 1996-97 a cold spell occurred around the turn of the year and may have been responsible for the high UK totals of Bar-tailed Godwit recorded in January and February. The winter index value for Sanderling has shown huge fluctuations in previous years. Most of our Sanderling winter on open coasts, which are not counted by the regular WeBS counts. Local movements of these birds may cause them to move onto nearby stretches of beach or open coast that are counted. We will find out more about these uncounted shores and their birds when the results of the 1997-98 Non-estuarine Coastal Waterfowl Survey are revealed. Two further species recorded 1996-97 indices more than 10% above the value recorded the previous year. The index for Oystercatcher was 28% up on the value of the previous winter to reach the highest level since 1990-91. For Dunlin a rise of 22% in 1996-97 caused the winter index to reach its greatest value for 20 years. For the first time, the UK winter index is published for Avocet. This is a reflection of the increasing numbers of birds wintering here now enabling a meaningful index to be calculated. The 1996-97 index of 2,050 represents an increase of 11% on the previous year and indicates a wintering population 20 times the size of that in 1972-73. The index for this Golden Plover is based on data from coastal sites for which we have long-term data. Equivalent data sets are not currently available for inland sites which hold a substantial proportion of the over-wintering population of this species.

Footnote

The selection of months for calculating indices for wildfowl and their allies was made by first calculating monthly index values for all months September to March, and selecting that with the highest index value and any adjacent months with overlapping consistency intervals. Data from all years from 1966-67 onwards were used for calculating the index for each of these species, as recommended in Kirby *et al.* (1995), with the exception Little Grebe (1985-86 onward), Great Crested Grebe (1982-83), Cormorant (1986-87), Coot (1982-83), and all species in Northern Ireland (1986-87). Caution is urged in particular regarding the first few years' index values for these species only recently included in the scheme; missing counts may have been incorrectly recorded as nil counts, giving rise to anomalous index values. The parameters used for indexing each species follow Kirby *et al.* (1995). Due to more stable populations of waders during the winter, the months December to February are chosen for calculation of index values for all waders for which there are suitable data. Due to the small number of sites in Northern Ireland, data are combined for analysis at the UK level.

The first letter of the months September to March is used to indicate those months used in calculating indices for each species in Great Britain and Northern Ireland

Species	GB	NI
Little Grebe	SO	SON
Great Crested Grebe	SON	SONDJFM
Cormorant	SONDJFM	SOND
Mute Swan	SONDJFM	SONDJ
Bewick's Swan	JF	NDJF
Whooper Swan	ND	ONDJFM
Pink-footed Goose	O or N	-
European Whitefront	JF	-
Greenland Whitefront	N or M	N or M
Greylag Goose: Icelandic	O or N	-
naturalised	S	-
Canada Goose	S	-
Barnacle Goose: Svalbard	any month	-
Dark-bellied Brent	DJF	-
Light-bellied Brent	-	SONDJFM
Shelduck	JF	DJFM
Wigeon	J	SONDJFM
Gadwall	SONDJFM	SONDJ
Teal	D	DJ
Mallard	D	SO
Pintail	ONDJ	ONDJFM
Shoveler	SO	SONDJFM
Pochard	NDJ	NDJF
Tufted Duck	NDJF	ONDJFM
Goldeneye	F	DJFM
Red-breasted Merganser	ONDJFM	SONDJFM
Goosander	DJF	-
Ruddy Duck	SONDJFM	-
Coot	SONDJ	SONDJFM

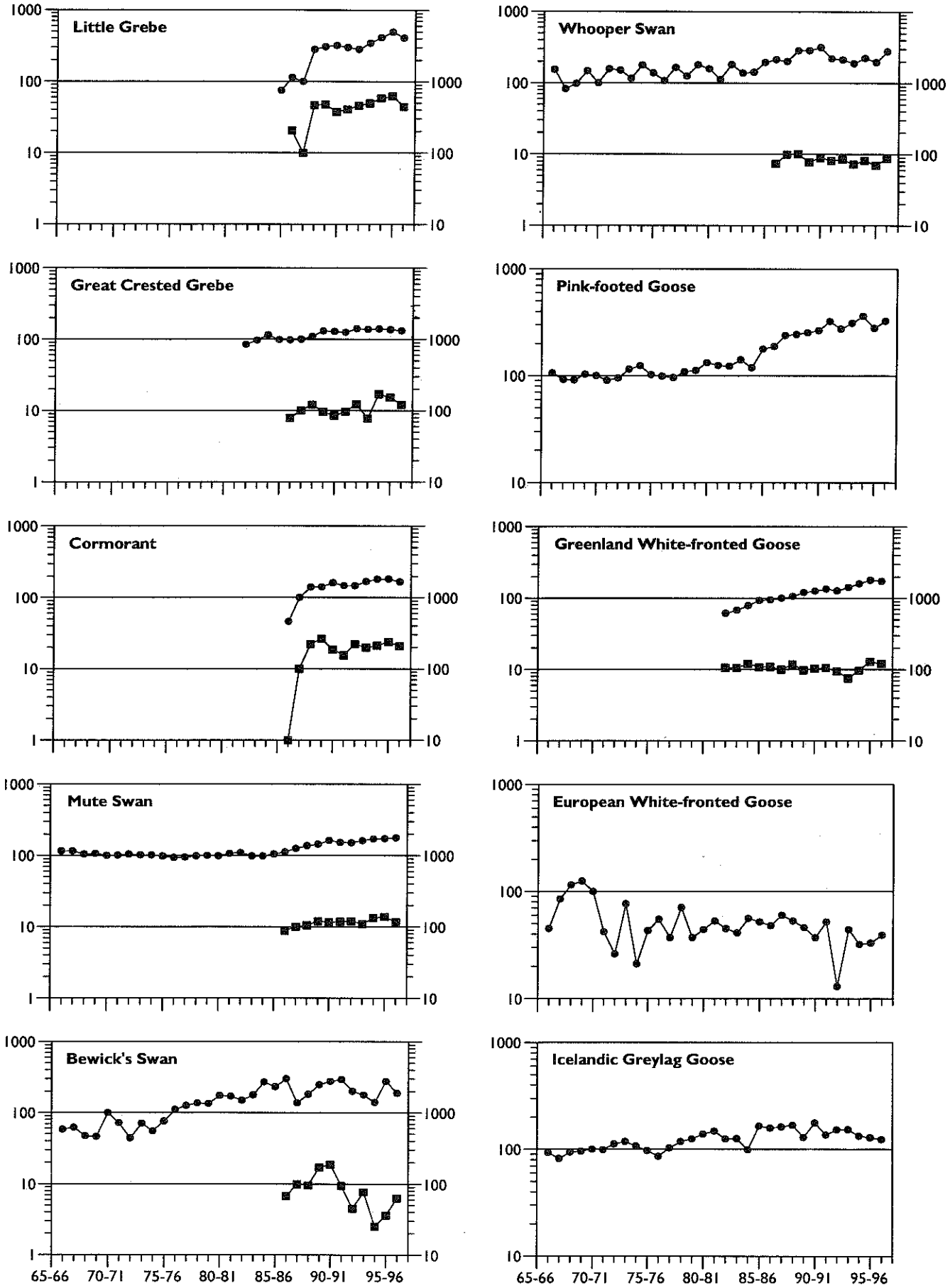

Figure 4. Index values for selected waterfowl species (see text for details). Circles represent values for Great Britain (plotted using the right hand axis) and squares represent Northern Ireland (plotted using the left hand axis). Note log scale.

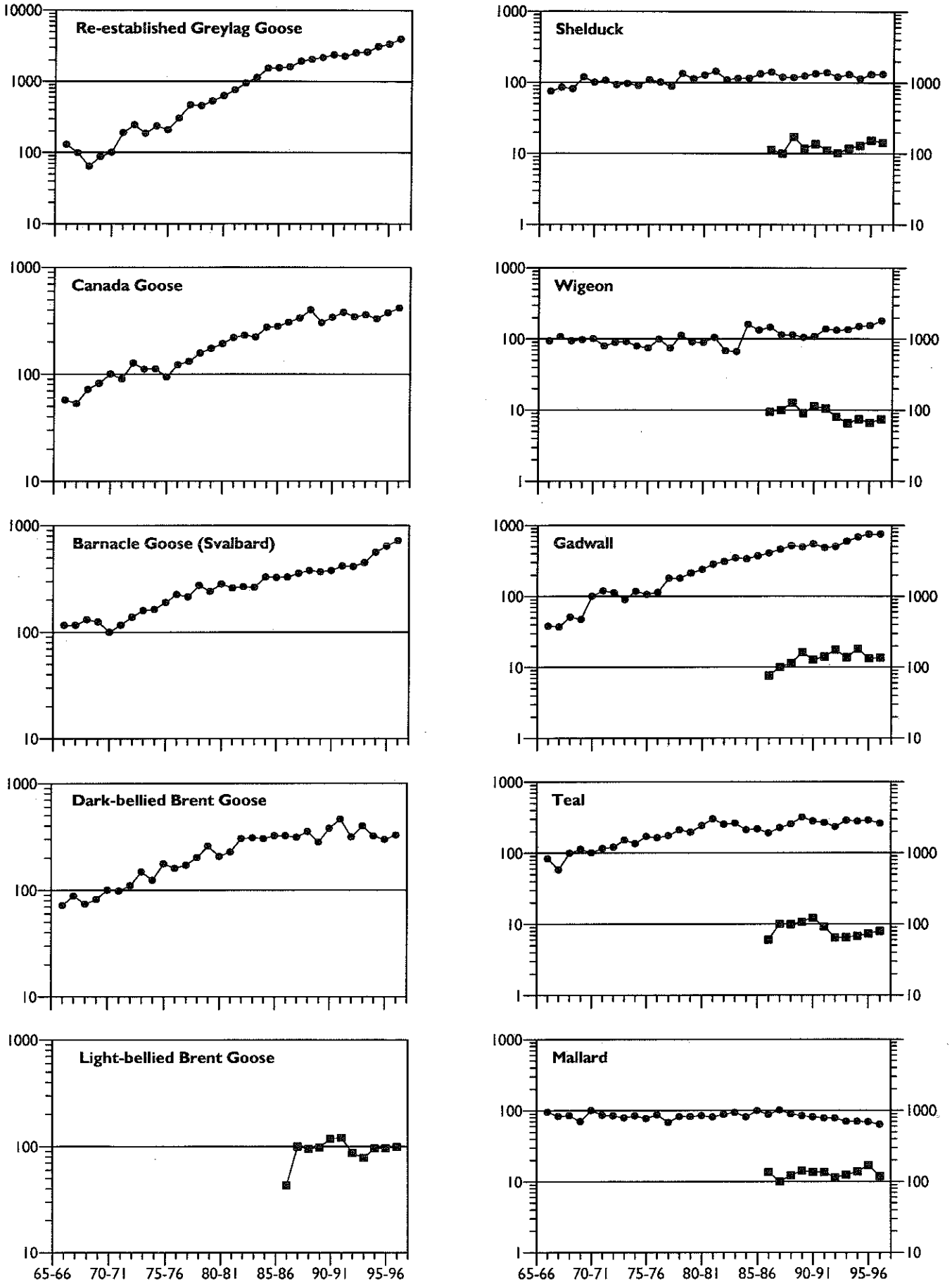

Figure 5. Index values for selected waterfowl species (see text for details). Circles represent values for Great Britain (plotted using the right hand axis) and squares represent Northern Ireland (plotted using the left hand axis). Note log scale. Note different scale for Greylag Goose.

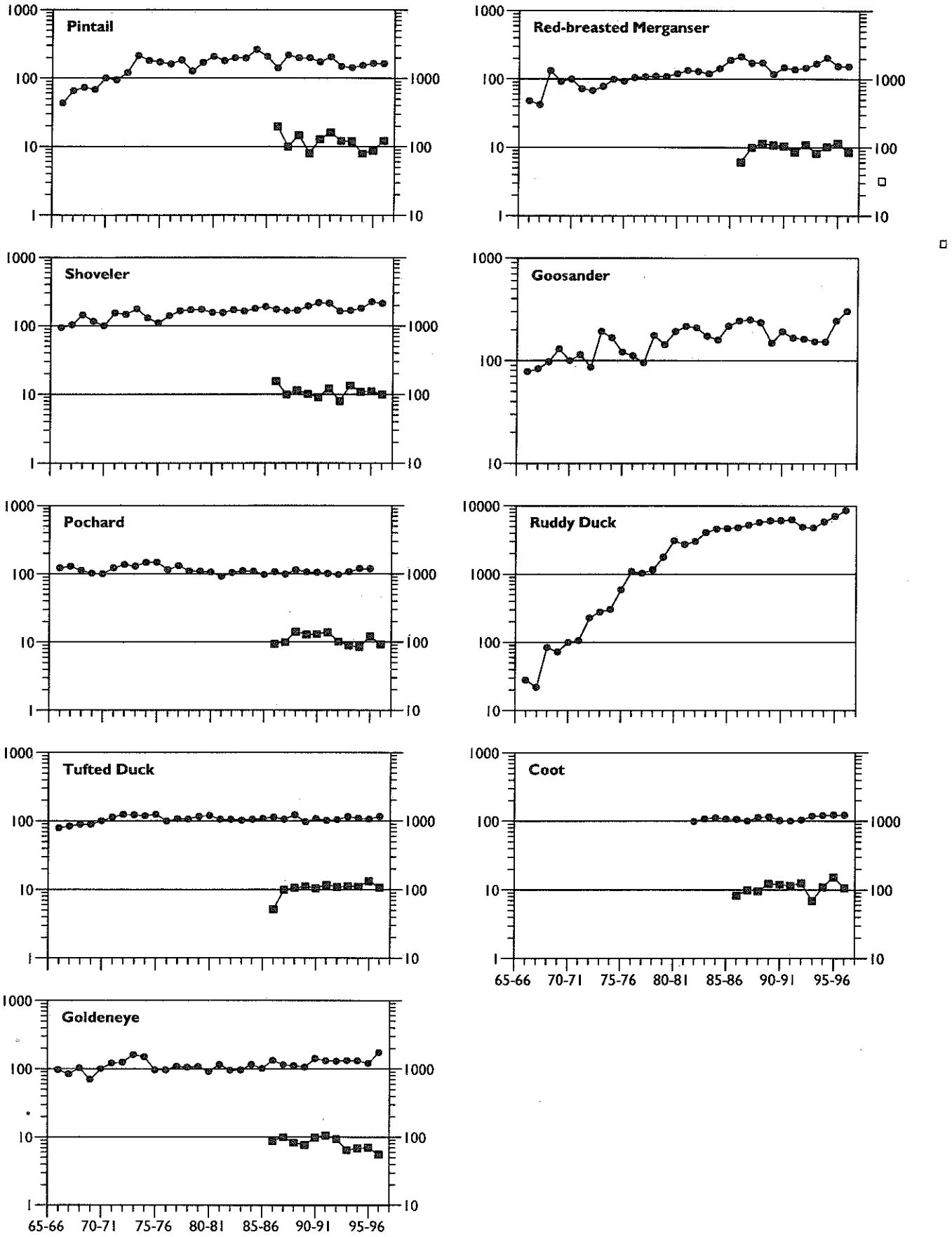

Figure 6 Index values for selected waterfowl species (see text for details). Circles represent values for Great Britain (plotted using the right hand axis) and squares represent Northern Ireland (plotted using the left hand axis). Note log scale. Note different scale for Ruddy Duck.

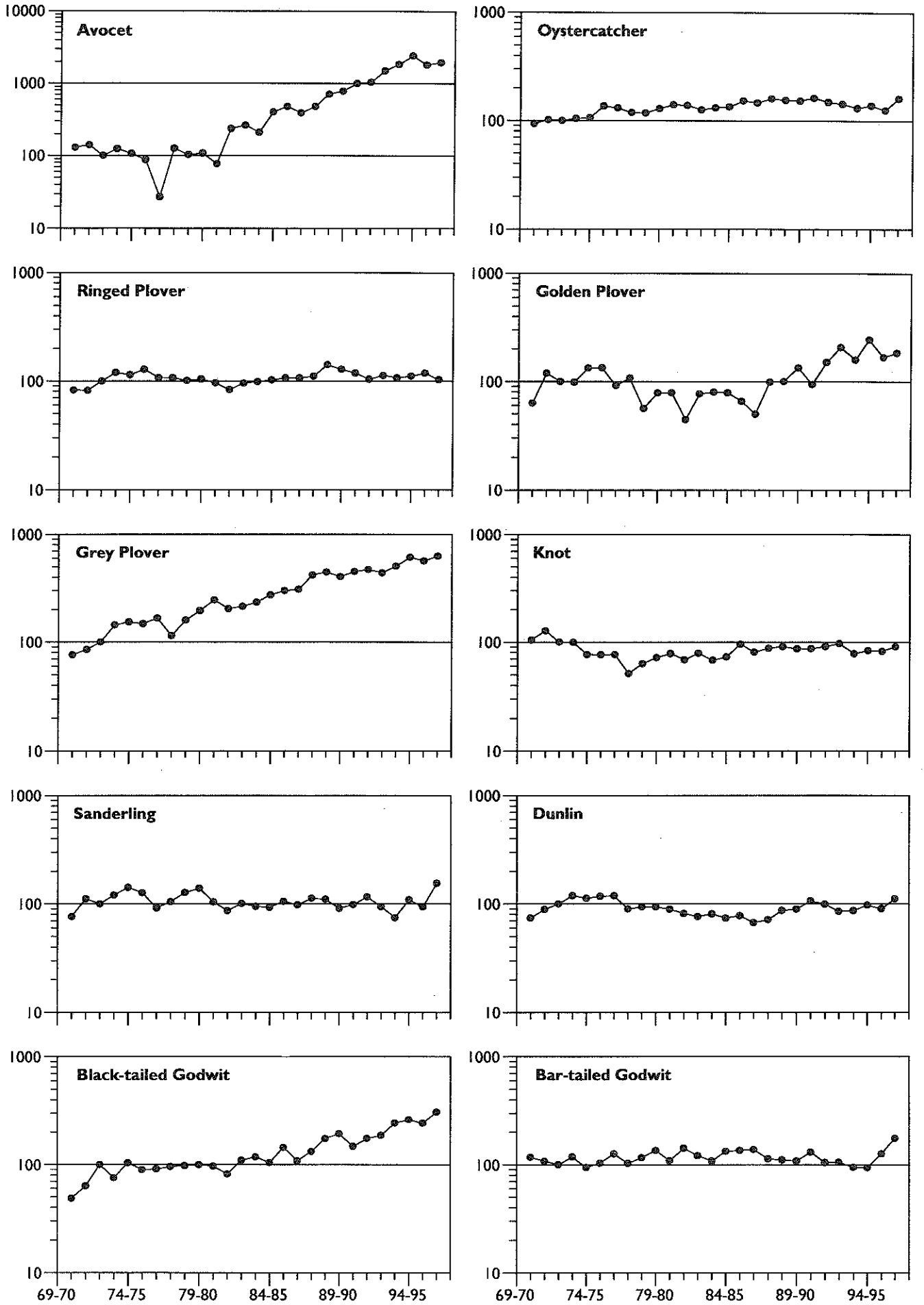

Figure 7 Index values for selected waterfowl species (see text for details). Circles represent values for the United Kingdom.

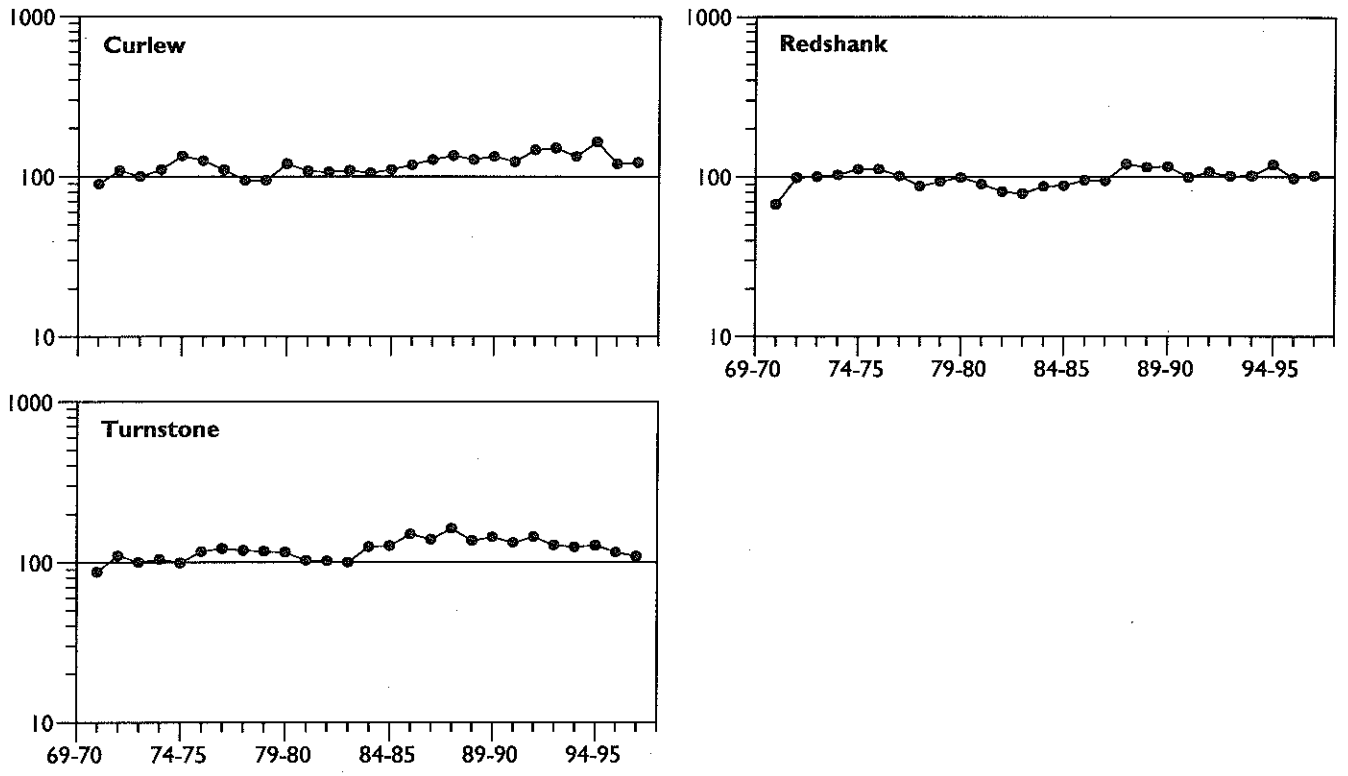

Figure 8 Index values for selected waterfowl species (see text for details). Circles represent values for the United Kingdom.

SPECIES ACCOUNTS

The following accounts provide information for each species in the following areas:

Key sites

Tables rank the principal sites for each species according to average seasonal maxima for the last five seasons. Peak counts, where available, are given for each of the last five seasons, and the month in which the peak 1996-97 count occurred. A dash "-" indicates a missing count and incomplete counts are bracketed. Sources of non-WeBS data are cited accordingly. Notably high or low counts and any consistent increases or declines in numbers at individual sites are highlighted in the text.

Note that, as a result of the submission of late data, correction of errors, and, in some cases, the use of different count seasons, some of the counts in this report differ from those presented previously. Most changes are minor, but appropriate comment is made in the text where they have significantly affected the status of the site.

In the first instance, average maxima were calculated using only complete counts but, if any incomplete counts exceeded this initial average, they were also incorporated and the averages recalculated. Averages enclosed by brackets are based solely on incomplete counts.

In the past the BTO has always recorded "count quality" of individual counts. Counts at any site are considered to be incomplete whenever significant under-recording is thought to have occurred, due to part of the site not being counted or adverse counting conditions. Such counts are identified using parentheses in the tables for waders, gulls, terns, herons and Kingfisher, and used selectively when deriving summary statistics. When counts from individual count sectors are added together to give an overall species count for larger sites, it must be borne in mind that for some large sites these counts might have been done under very different conditions. Consequently the visit qualities assigned to the various counted sectors contributing to a total may be quite different. Additionally a variable amount of the overall site may have been uncounted.

In order to construct site totals for the species tables these differences must be addressed. The importance of the contribution of each count sector to the site total is based on its average contribution to the total at the time of year in question and on recent years (to allow for seasonal and long term trends). Previously, it was only feasible to take an overview of the situation and consider the total number of waders which normally used each count sector and assign the same quality to all species of wader. However, now that we have more efficient means of analysis, we can address the question of the importance of individual count sectors on a species by species basis. This represents a significant refinement to the previously adopted strategy because a count sector which normally holds a significant proportion of a site total for species "A" may hold only a small proportion of the site total for species "B". Consequently, if such a count sector is not completely counted, the site total will now be treated as complete for species "B" but incomplete for species "A". This improved treatment of data will result in some of the "count qualities" published in this report differing from those previously published which. Species by species qualities are now also assigned to gulls, terns and herons.

In accounts for divers, grebes, Cormorant, herons, wildfowl and Kingfisher, seasonal maxima are derived from any month in 1994-95, 1995-96 and 1996-97 and from any of the months July to March inclusive in other years. Peak counts of wildfowl in April are normally attributed to the previous winter, e.g. a count in April 95 would be used as the 1994-95 peak. The tables presented in the wader accounts include data from only the winter period, November to March, although the text includes reports of sizable counts from any month, especially for species with important passage populations. The use of different months for the derivation of maxima is given in the species table headings.

All internationally important sites and all nationally important sites (either in a Great Britain context or, for sites in Northern Ireland, in an all-Ireland context) are given in the tables using a strict interpretation of the 1% threshold. However, it should be noted that, where this number is less than 50 birds, 50 is normally taken as the minimum threshold. For some species with very small national populations, and consequently very low 1% thresholds, an arbitrary, higher level has been chosen for the inclusion of sites and is highlighted in the text. Where no thresholds are given, e.g. for introduced species, and where no or very few sites in the UK reach the relevant national qualifying levels, an arbitrary threshold has been chosen to select a list of sites for this report. These thresholds are highlighted in the text, whilst a blank line has been inserted in the table to separate sites that qualify as nationally important from those selected for the purposes of this report using lower thresholds, including 1% thresholds of less than 50 birds.

It should also be noted that for sites to qualify as internationally important, this must be on the basis of demonstrated regular use, otherwise a large number of sites might qualify as a consequence of irregular visitation by one-off large numbers of waterfowl. This has been formalised by the Ramsar Convention which has indicated that assessments of qualifying sites must be on the basis of at least five years of data. However, the convention also indicates that provisional assessments may be made on the basis of a minimum of three years' data. These rules of thumb are applied to SPAs and national assessments also.

Thus, where species numbers on a site exceed the threshold value for just one or two years (the data for the remaining of the most recent five years being absent), this does not imply qualification. A site for which the mean of three or four year's counts exceed the threshold, the site is deemed of provisional importance at the relevant level. Where the five year peak mean exceeds the international threshold, the site 'qualifies' as of international importance.

In the wildfowl accounts, all sites which, in 1996-97, held nationally important numbers, or numbers exceeding the adopted threshold, but with five year means below this value are listed in the text. This serves to highlight important sites worthy of continued close attention. In the wader accounts, the "recent averages" mentioned refer to the averages based on the winters 1991-92 to 1995-96.

For convenience, sites in the Channel Islands are identified using 1% thresholds for Great Britain and included under the Great Britain section of the tables where relevant.

A few sites that have not been counted in recent years due to their isolated location, but were of national or international importance for one or more species when last counted, are listed in the accounts. This also serves to highlight the need for counting to be resumed.

Note that owing to possible boundary differences, the totals given for sites in this report are not necessarily the same as the totals for designated statutory sites (ASSIs/SSSIs, SPAs or Ramsar Sites) having the same name.

National context

The national totals (from Tables 1 & 2) and the yearly index values for the last five winters, where calculated, are repeated at the start of each species account for ease of reference. These are discussed in the text, providing the context to any notable counts at individual sites. The results of any other national or regional surveys and assessments of breeding success are also included.

1% thresholds

1% thresholds for International, Great Britain and all-Ireland populations are given for each species, except where these are unknown (indicated using "?"), where the population is too small for a meaningful figure to be obtained (indicated using "+"), where the population is derived from naturalised or escaped birds (see below) or where the species is scarce or a rarity in the UK (indicated using "vagrant" for wildfowl and allies and "scarce" for other species). These values are used to identify sites of importance which may qualify for designation under international and national legislation and Conventions. However, it should be noted that, where this value is less than 50 birds, 50 is normally used as the minimum threshold. An asterisk "*" has been used to highlight these instances (see Appendix 1 for a full explanation of national and international qualifying criteria).

It should be recognised that, in presenting only sites of national importance, this report provides just one means of identifying important sites and does not provide a definitive statement on the conservation value of individual sites for waterfowl, let alone other conservation interests. The national thresholds have been chosen to provide a reasonable amount of information in the context of this report only. Thus, for example, many sites of regional importance or those of importance because of the assemblage of species present are not included here. European Directives and conservation Conventions stress the need for a holistic approach to effect successful conservation, and lay great importance on maintaining the distribution and range of species, in addition to the conservation of networks of individual key sites.

Recent Research

A summary of key findings from relevant reports, scientific papers and journals published during the past year is provided for each species. Other highlights from the year are also included, such as conservation successes or failures, important conferences, or changes in legislation.

Non-native species

Following Holmes & Stroud (1995), non-native species which have become established are termed "naturalised". These species are categorised according to the process by which they became established: naturalised feral (domesticated species gone wild); naturalised introduction (introduced by man); naturalised re-establishment (species re-established in a area of former occurrence); and naturalised establishment (a species which occurs, but does not breed naturally, e.g. potentially Barnacle Goose in southern England). With the exception of vagrants, all other non-native species have been classed as escapes.

In line with the recommendations of Vinicombe *et al.* (1993), records of all species recorded by WeBS, including escapes, have been published to contribute to the proper assessment of naturalised populations and escaped birds. Note, however, that the publication of records of vagrants in this report does not imply acceptance by the British Birds Rarities Committee (e.g. Rogers and the Rarities Committee 1996). The native range is given in the species account for naturalised species, escapes and vagrants. Species are listed in approximately Voous order. A number of scientific names have been changed following the recommendations of the British Ornithological Union Records Committee (BOURC 1997).

Key to symbols commonly used in the species accounts

In tables of important sites:

- \- No data available.
- ( ) Incomplete count.

As footnotes to international and national thresholds:

- ? Population size not accurately known.
- \+ Population too small for meaningful figure to be obtained.
- * Where 1% of the national wintering population is less than 50 birds, 50 is normally used as a minimum threshold for national importance.
- ** A site regularly holding more than 20,000 waterfowl qualifies as internationally important by virtue of absolute numbers.

RED-THROATED DIVER
Gavia stellata

International importance: 750
Great Britain importance: 50
All-Ireland importance: 10*
*50 is normally used as a minimum threshold

GB maximum: 878 Jan
NI maximum: 38 Nov

Trend not available

Consistently high counts of this species were recorded in 1996-97 in Great Britain, with 500 or more in three separate months. The peak count was the second highest recorded by WeBS, surpassed only by the exceptional counts of the previous season. Counts in Northern Ireland were around average for the province.

Counts of 100 or more birds were recorded at three sites during the winter, with that on the North Norfolk Marshes the second highest recorded at any site during WeBS Core Counts and raising the site's status to nationally important. Although low count totals might be expected from Cardigan Bay and the Moray Firth in the last two winters due to the lack of dedicated sea-duck counts at these sites, high counts have been maintained at the former as a result of the large numbers recorded by WeBS off the Borth to Ynyslas coastline. No further sites in Great Britain or Northern Ireland recorded counts in excess of the national 1% thresholds.

The first national breeding survey in Great Britain in 1994 indicated an estimate of 3,010 adult birds, equating to some 855 breeding pairs (Gibbons *et al.* 1997) The stronghold remains on the Northern Isles, though the Shetland population has declined by more than a third in the last decade. The winter movements of the UK breeding population are poorly understood, and it is not known whether the majority of these birds winter in UK waters or further afield.

Table 5. RED-THROATED DIVER: MAXIMA AT MAIN RESORTS

	92-93	93-94	94-95	95-96	96-97	Month	Average
Great Britain							
Cardigan Bay	[1]390	[1]740	[1]252	900	528	Jan	562
Moray Firth	[2]350	[2]411	[2]385	(72)	(61)	Dec	382
North Norfolk Marshes	59	67	26	71	506	Jan	146
Dengie Flats	175	89	143	41	96	Dec	109
Clyde Est.	73	11	50	126	195	Mar	91
Forth Est.	63	83	72	98	124	Mar	88
Minsmere Levels	318	50	17	0	6	Feb	78
Northern Ireland							
Lo. Foyle	34	15	[3]40	83	18	Nov	38
Belfast Lo.	13	20	28	10	11	Nov/Dec	16
Craigalea to Newcastle	-	-	-	13	-		13

1 *Data from Friends of Cardigan Bay, e.g. Green & Elliott (1993)*
2 *RSPB/BP studies, e.g. Stenning (1994)*
3 *unpublished data*

BLACK-THROATED DIVER
Gavia arctica

International importance: 1,200
Great Britain importance: 7*
All-Ireland importance: 1*
*50 is normally used as a minimum threshold

GB maximum: 27 May
NI maximum: 2 Dec

Trend not available

The peak count of this least common British diver unusually occurred in May, influenced by a count of 19 on the Forth Estuary, and was lower than in recent years. Counts in most other months were more normal, though lacking the usual peak in December or January; partly as a result of the absence of winter counts for Arran and Loch Indaal. In total, 41 sites recorded Black-throated Divers in 1996-97, and though Scottish sites typically held the majority, 23 sites in England and Wales also registered wintering birds, eight of which were wandering individuals at inland lakes and reservoirs. Girvan to Turnberry (8, Nov) was the only other site, other than those listed in the Table below, which held more than seven birds in 1996-97. Belfast Lough (2, Dec) was the only site to hold Black-throated Divers in Northern Ireland.

Table 6. BLACK-THROATED DIVER: MAXIMA AT MAIN RESORTS

	92-93	93-94	94-95	95-96	96-97	Month	Average
Great Britain							
Moray Firth	[1]13	[1]53	[1]35	(5)	(6)	Jan/Feb	34
Lo. Ewe: Aultbea	-	-	14	-	-		14
Forth Est.	6	7	9	7	19	May	10
Arran	13	4	18	1	-		9
Lo. Indaal	2	0	31	11	1	May	9
Northern Ireland							
Belfast Lo.	0	0	1	2	2	Dec	1

1 *RSPB/BP studies, e.g. Stenning (1994)*

GREAT NORTHERN DIVER
Gavia immer

International importance: 50
Great Britain importance: 30*†
All-Ireland importance: ?†
***50 is normally used as a minimum threshold**

GB maximum: 59 Nov **Trend not available**
NI maximum: 10 Nov/Apr

The proportion of the population monitored by WeBS remains small, the peak count in Great Britain representing just 2% of the national estimate. In international terms, the UK is of considerable importance for this species, holding 60% of the European population, the major strongholds being the Northern and Western Isles and southwest Cornwall (Parrack 1986). The Great Britain peak was the second highest yet recorded by the scheme, boosted by the count of 39 birds on Traigh Luskentyre, Harris, the largest WeBS count of this species at a British site, although the absence of winter counts from Loch Indaal, the most important WeBS site for Great Northern Diver, and the Isle of Arran will have lowered the recorded totals. Fifty-two sites in Great Britain recorded Great Northern Divers in 1996-97, with three sites not listed in the Table below recording five or more birds: Helford Estuary (8, Mar), Poole Harbour (5, Dec) and North Norfolk Marshes (5, Jan).

Totals in Northern Ireland were low, with only three sites registering birds in 1996-97. Counts in the province fluctuate widely from year to year with weather conditions undoubtedly a major factor. Counts in the Republic of Ireland in February 1996 illustrated how the effect of suitable conditions at key sites can greatly improve national totals, with over 600 birds recorded, compared with just 80-150 during the rest of the winter (Delany 1997).

Table 7. GREAT NORTHERN DIVER: MAXIMA AT MAIN RESORTS

	92-93	93-94	94-95	95-96	96-97	Month	Average
Great Britain†							
Moray Firth	[1]40	[1]17	[1]14	(2)	(8)	Jan	24
Lo. Indaal	14	21	13	16	10	Apr	15
Traigh Luskentyre	0	-	3	12	39	Nov	14
Arran	13	8	5	3	-		7
Sound of Taransay	6	-	-	-	-		6
Lo. Beg/Scridain	6	5	4	6	6	Oct/Nov/Apr	5
Northern Ireland†							
Lo. Foyle	29	3	[2]20	15	10	Apr	18
Tyrella	-	-	-	12	-		12
Carlingford Lo.	13	1	12	26	1	Feb	11
Dundrum Bay	40	0	2	2	0		9
Kilkeel to Lee Stone Point	-	-	-	8	-		8
Craigalea to Newcastle	-	-	-	5	-		5

† *as no site in GB is of national importance for Great Northern Diver and as no threshold has been set in Northern Ireland for national importance, a qualifying level of five has been used as the basis for selecting sites for presentation in this report*
1 *RSPB/BP studies (e.g. Stenning 1994)*
2 *unpublished data*

LITTLE GREBE
Tachybaptus ruficollis

International importance: ?
Great Britain importance: 30*
All-Ireland importance: ?†
*50 is normally used as a minimum threshold

GB maximum:	**3,672**	**Sep**
NI maximum:	**596**	**Jan**

Trend	**92-93**	**93-94**	**94-95**	**95-96**	**96-97**
GB	**283**	**347**	**414**	**495**	**409**
NI	**461**	**497**	**585**	**626**	**447**

The peak count in Great Britain was around 10% lower than the record totals in 1995-96, though numbers still regularly surpassed the current winter population estimate of 3,000. These counts, and the sustained high index values of recent years clearly indicate that the population estimate will increase when it is next revised. The species is known to be susceptible to harsh weather conditions (Moss & Moss 1993) and monthly fluctuations show a sharper than usual decline in the proportion of birds present during the latter half of the winter, perhaps suggesting a higher than normal level of mortality following the cold snaps in late December and January. The peak count in Northern Ireland was the lowest this decade, some 25% down on the 1995-96 peak and occurring unusually late in the winter in January. Monthly fluctuations, however, suggest that, taking into account the effects of varying coverage throughout the winter, the peak month of occurrence was a more typical October. The yearly index reached its lowest value in last five years.

Some 43 sites currently surpass the respective levels for national importance in Great Britain and all-Ireland importance in Northern Ireland. Of these, counts at 13 British sites exceeded the minimum threshold of 50 birds usually used for site designation purposes. Whilst the highest count of 376 again occurred at Loughs Neagh/Beg, the figure was well below the counts of recent years. Not surprisingly, after the record counts of 1995-96, 70% of sites recorded peak counts below that of the previous season, though the falls of 50% on the Thames Estuary and at Holme Pierrepont Gravel Pits were particularly dramatic. Increases at Chew Valley Lake, the Swale and Cleddau Estuaries and Eyebrook Reservoir were thus noteworthy.

The following sites each held 30 or more birds in 1996-97: Hogganfield Loch (45, Oct), Barton Pits (43, Oct), Haverton Hole (38, Aug), Lower Derwent Valley (37, Dec), River Test: Broadlands Estate (35, Aug), Hilfield Park Reservoir (35, Sep), Lough Money (35, Dec), Whisby Gravel Pits (33, Sep), Fen Drayton Gravel Pits (32, Sep), Windermere (31, Feb) and the River Derwent: Chatsworth (30, Sep).

Table 8. LITTLE GREBE: MAXIMA AT MAIN RESORTS

	92-93	93-94	94-95	95-96	96-97	Month	Average
Great Britain							
Thames Est.	182	160	328	477	251	Nov	280
Swale Est.	65	77	202	195	213	Nov	150
Holme Pierrepont GP	95	127	105	162	80	Sep	114
Chew Valley Lake	83	75	106	122	152	Sep	108
Wash	63	92	120	146	53	Nov	95
Avon Valley (Mid)	52	67	81	86	68	Nov	71
Deben Est.	48	87	66	49	63	Dec	63
North Norfolk Marshes	34	58	56	93	51	Jan	58
R. Test: Fullerton to Stockbridge	63	43	55	62	52	Jan	55
Chichester Hbr	36	35	50	100	52	Dec	55
Cleddau Est.	31	27	49	75	91	Dec	55
Rutland Water	15	68	60	83	35	Aug	52
Medway Est.	49	51	54	60	42	Dec	51
Eyebrook Rsr	28	27	43	70	76	Sep	49
Kings Mill Rsr	70	68	40	23	29	Oct	46
Tees Est.	39	47	53	42	47	Sep	46
Cameron Rsr	18	40	63	70	33	Sep	45
R Soar: Leicester	43	-	-	-	-		43
Blackwater Est.	24	29	52	59	44	Sep	42
Fleet/Wey	46	46	37	37	30	Nov	39
Barleycroft GP	-	-	-	54	23	Oct	39
Sutton/Lound GP	26	-	17	72	39	Sep	39
Hamford Water	21	52	28	72	18	Dec	38
Middle Tame Valley GP	40	40	25	52	31	Oct	38
Blagdon Lake	39	26	39	59	23	Sep	37
Pirton Pool	-	-	29	37	41	Sep	36
Lee Valley GP	31	44	27	45	29	Sep	35
Wraysbury GP	49	33	32	27	32	Jan	35
Bewl Water	6	14	47	57	44	Oct	34

	92-93	93-94	94-95	95-96	96-97	Month	Average
Southampton Water	25	42	25	37	38	Dec	33
Morecambe Bay	30	46	32	27	31	Jan	33
Pitsford Rsr	5	9	53	64	32	Sep	33
Portsmouth Hbr	28	32	36	36	30	Nov	32
Fisherwick/Elford GP	39	37	20	40	24	Sep	32
Cemlyn Bay	22	32	33	40	33	Nov	32
Orwell Est.	28	26	37	36	31	Sep	32
Hanningfield Rsr	54	18	24	32	29	Aug	31
Somerset Levels	15	14	34	37	55	Mar	31
Alde Complex	16	9	37	51	38	Sep	30
Kilconquhar Lo.	1	20	36	52	42	Sep	30
Northern Ireland†							
Lo. Neagh/Beg	442	399	535	626	376	Oct	476
Strangford Lo.	134	123	102	169	140	Jan	134
Upper Lo. Erne	27	54	84	62	73	Jan	60

† *as no threshold has been set for national importance for Little Grebe in Northern Ireland, a qualifying level of 30 has been used as the basis for selecting sites for presentation in this report*

GREAT CRESTED GREBE
Podiceps cristatus

International importance: 1,500
Great Britain importance: 100
All-Ireland importance: 30*
***50 is normally used as a minimum threshold**

GB maximum: 8,209 Sep
NI maximum: 2,036 Sep

Trend	92-93	93-94	94-95	95-96	96-97
GB	141	138	140	137	132
NI	122	78	170	153	121

As with Little Grebe, the early autumn peak of Great Crested Grebes arises from young birds augmenting the breeding population, whilst the subsequent decline reflects mortality and perhaps dispersal to coastal areas less well covered by the scheme. The low peak count in 1996-97 compared with recent years is reflected in the indices also. In Northern Ireland, numbers similarly peaked early in the autumn, though the count was some 30% down on that recorded during the previous season. Loughs Neagh & Beg and Belfast Lough between them support the vast majority of the Northern Irish population and the absence of counts from the latter in October accounts for the drop in the monthly totals and similarly has a significant effect on the figures presented in the monthly fluctuations (Table 3). Index values fluctuate widely between years, and that for 1996-97 was about the mean of these.

A 1% threshold of 1,500 birds for international importance has been set for the first time (Rose & Scott 1997). Only Loughs Neagh & Beg currently meets this level, though numbers at Belfast Lough hover around this value. Rutland Water remains the premier site in Great Britain, though the peak count fell for the third consecutive year and was the lowest since 1982-83. Counts on the Colne Estuary, though often variable, have dropped markedly in recent years, and it seems likely that the site will no longer be of national importance following the 1997-98 season. Counts on Grafham Water, Blagdon Lake, Queen Mary Reservoir and the Solway Estuary were noticeably higher than in recent years. Other sites supporting in excess of 100 birds in 1996-97 were Queen Mother Reservoir (130, Nov), Durham Coast (126, Jul), Cotswold Water Park (East) (118, Oct) and Staines Reservoirs (109, Jun). No other sites in Northern Ireland held counts of 30 or more birds.

Table 9. GREAT CRESTED GREBE: MAXIMA AT MAIN RESORTS

	92-93	93-94	94-95	95-96	96-97	Month	Average
International							
Lo. Neagh/Beg	2,022	571	2,533	2,440	1,537	Aug	1,821
Great Britain							
Rutland Water	720	894	741	579	378	Jan	662
Forth Est.	923	671	627	411	597	Sep	646
Chew Valley Lake	520	675	600	615	645	Oct	611
Lade Sands	-	580	-	[1]277	(0)		429
Queen Mary Rsr	349	411	307	298	593	Jan	392
Lavan Sands	[4]273	[4]275	[4]508	[4]283	[4]244	Aug	317
Morecambe Bay	353	348	277	296	286	Feb	312
Cardigan Bay	[2]322	[2]229	(4)	(5)	311	Dec	287
Grafham Water	180	181	175	377	506	Jan	284

	92-93	93-94	94-95	95-96	96-97	Month	Average
Stour Est.	187	250	260	312	261	Sep	254
Thanet Coast	339	250	504	0	166	Dec	252
Lo. Ryan	252	(42)	[3]258	[3]201	(15)	Sep	237
Cotswold WP West	223	214	233	189	181	Oct	208
Pitsford Rsr	141	172	215	188	304	Dec	204
Wraysbury GP	157	178	167	167	263	Nov	186
Abberton Rsr	247	55	59	238	248	Nov	169
Colne Est.	614	40	98	67	8	Jan	165
Hanningfield Rsr	117	298	185	124	59	Jun	157
Mersey Est.	277	139	95	61	169	Oct	148
Pegwell Bay	93	44	450	82	8	Dec	135
Blithfield Rsr	122	153	155	70	169	Jul	134
Attenborough GP	120	134	137	120	155	Oct	133
Alton Water	142	107	183	120	109	Sep	132
Queen Elizabeth II Rsr	85	88	105	258	118	Sep	131
King George VI Rsr	56	47	104	401	41	Dec	130
Dee Est. (Eng/Wal)	125	62	147	110	205	Sep	130
Blackwater Est.	122	84	145	171	118	Sep	128
Eyebrook Rsr	146	38	99	167	155	Sep	121
Wraysbury Rsr	70	114	82	265	52	Oct	117
Blagdon Lake	93	62	87	67	270	Dec	116
Solway Est.	85	96	58	113	205	Dec	111
Lee Valley GP	44	44	157	132	158	Sep	107
Ardleigh Rsr	115	112	123	94	84	Jul	106
Medway Est.	135	72	104	161	49	Jan	104
Wash	57	140	128	96	87	May	102
Northern Ireland							
Belfast Lo.	1,771	1,318	1,650	1,350	1,200	Dec	1,458
Lo. Foyle	224	80	[5]480	488	116	Nov	278
Carlingford Lo.	140	101	295	143	364	Dec	209
Upper Lo. Erne	231	164	111	90	276	Mar	174
Larne Lo.	92	110	122	147	124	Sep	119
Strangford Lo.	71	95	40	182	83	Dec	94
Craigalea to Newcastle	-	-	-	35	-		35

1 *D. Walker (in litt.)*
2 *data from Friends of Cardigan Bay, e.g. Green & Elliott (1993)*
3 *P. Collin (in litt.)*
4 *data from CCW*
5 *unpublished data*

RED-NECKED GREBE
Podiceps grisegena

International importance: 330
Great Britain importance: 1*†
All-Ireland importance: ?
***50 is normally used as a minimum threshold**

GB maximum: 50 Mar **Trend not available**
NI maximum: 0

Relatively small numbers of Red-necked Grebes occur in Britain each year, and, though their provenance is unknown, it is most likely that they stem from the Danish breeding population. The peak count of 50 birds is about average for the six years in which the species has been routinely recorded by WeBS, though much lower than the peaks of 102 and 80 recorded in the two most recent winters. Counts of 30-50 birds were maintained throughout September to March, and there is no discernable pattern in the month of peak occurrence between winters.

The species' distribution is predominantly along the east and south coast, although wandering individuals can be found on any larger inland waters, particularly in the Southeast, and often stay for several weeks or even months. In total, 50 sites registered counts of one or more birds, though the Forth Estuary remains the only site to record double figure counts regularly and the only one to reach the 50 birds required for site designation. No other site held five or more birds in 1996-97.

Table 10. RED-NECKED GREBE: MAXIMA AT MAIN RESORTS

	92-93	93-94	94-95	95-96	96-97	Month	Average
Great Britain†							
Forth Est.	22	44	89	[1]52	44	Sep	50
North Norfolk Marshes	1	0	4	19	2	Dec	5

† *as the 1% threshold for national importance in Great Britain is so small, a qualifying level of five has been used as the basis for selecting sites for presentation in this report*

1 *SNH funded surveys in SE Scotland, WWT unpubl. data*

SLAVONIAN GREBE
Podiceps auritus

International importance: 50
Great Britain importance: 4*
All-Ireland importance: ?†
***50 is normally used as a minimum threshold**

GB maximum: 234 Mar **Trend not available**
NI maximum: 24 Apr

Numbers in Great Britain in winter 1996-97 dropped slightly from the high counts of the two previous winters, though totals remain well above levels from previous years. As in 1995-96, the peak occurred late in the winter, possibly detecting Icelandic passage birds or pre-breeding gatherings of native Scottish birds. Northern Ireland totals rely predominantly, and sometimes totally, on those at Lough Foyle.

A number of factors suggest that the current population estimate of 400 birds (Chandler 1986) may underestimate the true number in Britain. Though little is known about the provenance of birds wintering in the UK, the population is likely to include birds from at least three separate breeding areas: the Scottish breeding population of around 60 pairs; a proportion of the Icelandic breeding population (500-750 pairs); and some of the easterly breeding birds from Scandinavia and Russia, though supported by only a single ringing recovery of a Russian bird found in Yorkshire (Chandler 1986). Since both WeBS and the *Winter Atlas* miss many areas of potentially suitable habitat, Evans (in prep.) reviewed county birds reports and other literature. Both mean and median peak values for sites in mid winter were summed, producing an estimate of 635-650 birds, over 50% higher than the current number.

Three sites in the UK currently support internationally important numbers of Slavonian Grebe, with Lough Foyle, which holds the majority of the birds in both Northern Ireland and the Republic, being added to the list this year. A further 17 sites support more than 1% of the population, the majority of which are either Scottish or on the south coast of England. The count of 107 birds on the Forth Estuary is the largest count at a single site yet recorded by WeBS, and numbers on the Clyde Estuary were also noteworthy. Lavan Sands (5, Mar), Camel Estuary (4, Mar), Cleddau Estuary (4, Jan) and the Fal Complex (4, Dec) were the only other sites to support 4 or more birds in 1996-97.

Table 11. SLAVONIAN GREBE: MAXIMA AT MAIN RESORTS

	92-93	93-94	94-95	95-96	96-97	Month	Average
International							
Forth Est.	32	28	78	[1]108	107	Mar	71
Moray Firth	[2]60	[2]53	66	(8)	(22)	Dec	60
Lo. Foyle	51	3	[4]71	103	24	Apr	50
Great Britain							
Pagham Hbr	57	14	75	23	29	Feb	40
Lo. of Harray	39	9	36	31	6	Mar	24
North Norfolk Marshes	2	2	6	77	17	Feb	21
Lo. Indaal	19	22	37	20	2	Sep/Apr	20
Studland Bay	-	8	17	16	-		14
Blackwater Est.	11	8	13	22	14	Feb	14
Clyde Est.	0	1	8	25	32	Mar	13
Traigh Luskentyre	0	-	9	24	13	Mar	12
Sound of Taransay	12	-	-	-	-		12
Poole Hbr	10	8	15	13	10	Dec	11
North West Solent	4	6	5	13	12	Mar	8
Chichester Hbr	5	5	10	3	13	Mar	7
Lo. Fleet	7	0	17	1	9	Feb	7
Lo. of Swannay	-	4	4	8	10	Nov	7
Lindisfarne	2	4	3	15	8	Apr	6
Exe Est.	4	11	5	6	2	Dec	6

	92-93	93-94	94-95	95-96	96-97	Month	Average
Lo. Ryan	7	0	[3]6	[3]19	0		6
Tamar Complex	1	1	2	9	7	Jan	4

† *as no threshold has been set for national importance for Slavonian Grebe in Northern Ireland, a qualifying level of four has been used as the basis for selecting sites for presentation in this report*

1 *SNH funded surveys in SE Scotland (WWT, unpubl. data)*
2 *RSPB/BP studies (e.g. Stenning 1994)*
3 *P. Collin (in litt.)*
4 *unpublished data*

BLACK-NECKED GREBE
Podiceps nigricollis

International importance: 1,000
Great Britain importance: 1*†
All-Ireland importance: ?
***50 is normally used as a minimum threshold**

GB maximum: 46 Dec **Trend: not available**
NI maximum: 0

The modest numbers of Black-necked Grebes that frequent British wetlands in winter occur in small gatherings at a few favoured sites, the remainder being wandering individuals scattered widely throughout the country. The 1996-97 peak was comparable with that of most winters and represents between one third and one half of the estimated number thought to winter in Great Britain. The small breeding population numbers around 40 pairs (Elliott 1993), and several WeBS sites counted during the summer months, particularly in the species' breeding strongholds of the English midlands and central eastern Scotland, record peak counts at this time. The species has yet to be recorded during WeBS counts in Northern Ireland. Average peak counts at only the two sites below exceed five. Other sites supporting five or more birds in 1996-97 were Abberton Reservoir (5, Sep) plus one site in central eastern Scotland holding five birds in July.

Table 12. BLACK-NECKED GREBE: MAXIMA AT MAIN RESORTS

	92-93	93-94	94-95	95-96	96-97	Month	Average
Great Britain†							
Langstone Hbr	28	26	21	24	19	Dec	24
Studland Bay	-	11	14	12	-		12

† *as the 1% threshold for national importance in Great Britain is so small, a qualifying level of 10 has been used as the basis for selecting sites for presentation in this report*

BITTERN
Botaurus stellaris

Scarce

The peak UK total for 1996-97 was recorded in January when 27 Bitterns were reported. This is more than double the corresponding values of the previous two years. The figure of 26 sites reporting one or more birds during the year is also on the high side. Of these, only Carmarthen Bay and the Fleet/Wey are not inland sites. Apart from single records in May, July and August all records referred to the period October to March. Counts exceeding two birds were reported from Stodmarsh (6, Jan), St Ouen's Pond (5, Jan), Fleet Pond (4, Jan) and Leighton Moss (3, Jan & Mar). As with the full list of records these sites show a definite preponderance of S England sites.

CATTLE EGRET
Bubulcus ibis

Scarce

For the second consecutive year this vagrant from the south was recorded during WeBS counts. One bird was recorded from Brading Harbour on the Isle of Wight in May whilst presumably another individual was seen at Poole Harbour in October.

LITTLE EGRET
Egretta garzetta

International importance: 1,250
Great Britain importance : ?†
All-Ireland importance: ?†

GB maximum: 502 Oct **Trend not available**
NI maximum: 0

The 1996-97 peak British total of 502 birds was again recorded in October. With the qualifying level set at 1,250 birds, no UK sites come remotely close to being internationally important for this species. No level has been set for national importance so Table 13 lists those sites where the average peak exceeds 30 birds. As expected, all sites are in southernmost Britain. At the top of the table is Longueville Marsh, an inland site on the Channel Isles, but all other sites listed are estuaries. When compared to the average counts, there is no clear pattern of increase nor decrease in 1996-97. It will be interesting to see if the 1997-98 Little Egret survey can provide further insight into the fortunes of this recent colonist, which was first recorded breeding in Great Britain in 1996.

Table 13. LITTLE EGRET: MAXIMUM COUNTS AT MAIN RESORTS

	93-94	94-95	95-96	96-97	Month	Average
Sites with average peak counts of more than 30 birds†						
Longueville Marsh	(0)	(90)	(82)	130	Oct	130
Chichester Hbr	(44)	55	99	74	Aug	76
Tamar complex	(48)	45	83	69	Sep	66
Poole Hbr	24	42	58	57	Sep	45
Camel Est.	(2)	29	49	46	Oct	41
Kingsbridge Est.	27	23	48	47	Nov	36
Langstone Hbr	(10)	(14)	36	32	Nov	34
NW Solent	9	16	86	16	Nov	32

† *as no threshold has been set for national importance for Little Egret a qualifying level of 30 has been used as the basis for selecting sites for presentation in this report.*

GREY HERON
Ardea cinerea

International importance: 4,500
Great Britain importance : ?†
All-Ireland importance: ?†

GB maximum: 3,666 Sep **Trend not available**
NI maximum: 328 Sep

As in 1995-96, the peak total of Grey Herons recorded in the UK during the 1996-97 winter was close to 4,000 birds. Again, the peak count was recorded in autumn, presumably when the population is swollen by recently fledged juveniles. As no sites qualify for international importance, and no level has been set for national importance, Table 14 lists all sites where the mean peak averages more than 50 birds. About half of these sites are estuarine. Around half the sites listed produced above average counts in 1996-97 with the biggest increases recorded at Tring Reservoirs (up 84%) and the Ribble Estuary (up 80%).

Table 14. GREY HERON: MAXIMUM COUNTS AT MAIN RESORTS

	93-94	94-95	95-96	96-97	Month	Average
Sites with average peak counts of more than 50 birds†						
Walthamstow Rsr	100	-	310	300	Jul	237
Lo. Neagh/Beg	167	123	207	198	Aug	174
Deeping St James Gravel Pits	100	220	-	-		160
Somerset Levels	94	89	(99)	115	Jan	99
Tamar complex	(91)	114	87	64	Oct	89
Taw/Torridge Est.	64	68	78	125	Aug	84
Thames Est.	62	(94)	117	93	Oct	83
Strangford Lo.	73	69	87	79	Sep	77
Montrose Basin	44	86	(74)	71	Aug	69
Wash	63	84	55	(35)	Oct	67
Morecambe Bay	45	65	87	70	Sep	67
Coombe Pool	23	120	53	-		65
Severn Est.	40	41	121	54	Dec	64
Dee Est. (Eng/Wales)	86	38	73	58	Sep	64
Tring Rsr	(22)	44	25	(116)	May	63
Tees Est.	71	70	(43)	38	Aug	60

	93-94	94-95	95-96	96-97	Month	Average
R Avon: Britford Water Meadows	42	(68)	56	70	Jan	59
Burry Inlet	(31)	67	57	50	Jul	58
Avon Valley (Mid)	4	37	123	(11)	Sep	55
Ribble Est.	39	42	40	99	Sep	55
Poole Hbr	62	55	55	34	Sep	52
Ouse Washes	46	66	42	(34)	Oct	51

† *No qualifying levels have been set for national importance. Those sites with average peak counts of more than 50 birds are listed.*

PURPLE HERON — Scarce

Ardea purpurea

One bird recorded at Slapton Ley in July and August 1996 is a typical record for date and locality.

SPOONBILL — Scarce

Platalea leucorodia

Recorded on WeBS counts in small numbers in all seasons, the peak UK total for Spoonbill in 1996-97 was five birds in September. Counters at 12 sites in England were fortunate enough to record this species in 1996-97 with two or more birds at North Warren and Thorpeness Mere (3, Sep), Morecambe Bay (3, Jun), Tamar complex (2, Nov), Poole Harbour (2, Sep & Nov) and the Dee Estuary (England/Wales) (2, May).

CORMORANT

Phalacrocorax carbo

International importance: 1,200
Great Britain importance: 130
All-Ireland importance: ?†

GB maximum:	**14,158**	**Dec**
NI maximum:	**1,454**	**Dec**

Trend	92-93	93-94	94-95	95-96	96-97
GB	146	169	181	182	166
NI	223	198	211	238	209

The WeBS peak count and yearly index values for 1996-97 both showed a sharp decrease in both Great Britain and Northern Ireland, although the British population is clearly still well in excess of the current estimate of 13,000 birds. Nevertheless, the index value for Britain remains considerably higher than in 1987-88, indicative of a continuing increase, though numbers approximate stability in Northern Ireland.

Kershaw & Hughes (1997) have undertaken a detailed analysis of WeBS counts for fish-eating birds in the UK. They show that the total number of Cormorants counted between 1990-91 and 1994-95 remained relatively stable at 15-16,000 birds, around half of which were inland. Numbers have levelled off in most regions and have even declined in north-east Scotland. Sustained increases were observed in only south-west England and south Wales. Numerically, the most important wintering areas for Cormorants were south-east England (five year mean peak count 4,250 birds), east central England (*c.* 3,400 birds), and north-west England and north Wales (*c.* 2,200 birds). In comparison, most regions in Scotland held around 1,000 birds. Cormorant numbers have stabilised on all habitats except gravel pits.

A questionnaire survey of Cormorant roosts and inland breeding sites (Sellers & Hughes 1997) resulted in the identification of 51 sites in Britain at which inland breeding has been attempted: 39 in England, eight in Scotland and four in Wales. Ten of these are historical (that is, involve breeding before 1950). With the exception of the long-established breeding colony at Craig-yr-Aderyn, Gwynedd, there are no inland breeding colonies in Wales and the two colonies in Scotland (Mochrum/Castle Lochs and Loch an Tomain) are both within 5 km of the coast. All breeding attempts in Scotland have been within 30 km of the coast, while 49% of those in England have occurred at sites more than 30 km inland. Most inland breeding attempts have taken place in south-east England and most established colonies are located here. The number of Cormorants breeding inland increased at 28% per year between 1991 and 1995, and by 17% between 1995 and 1996. Recent research shows this to be a product of the rapidly expanding population of the continental subspecies *Phalacrocorax carbo sinensis*. Most of the inland colonies in south-eastern England are comprised mainly of this subspecies, while coastal colonies and the inland colonies at Craig-yr-Aderyn and Haweswater in Cumbria are largely of the North Atlantic subspecies *P. c. carbo*.

Following a complete survey of Cormorant breeding colonies in Wales in 1996 (following the *Sea Empress* oil spill), numbers were monitored at 21 Welsh colonies in 1997 (Newson *et al.* 1997). Most colonies held similar numbers of birds to 1996, but the 187 apparently occupied nests (aon) at St. Margaret's Island were the second lowest

number recorded since annual monitoring began in 1969. Only in 1983 were fewer pairs recorded, although 187 aon were also recorded in 1991. Significant movements of birds between colonies were implied by complementary increases and decreases in numbers at three pairs of neighbouring colonies.

WWT is close to completing a three year study of the feeding behaviour of fish-eating birds, including Cormorants. This forms part of a MAFF/DETR/EA research programme addressing the perceived economic problems at inland fisheries. Radio- and satellite-tracking of birds caught at Rutland and Grafham Water have provided some fascinating results (Bowler *et al.* 1997).

Individual Cormorants were generally site faithful to preferred roosting and feeding sites, and usually fed within a 25 km radius of their roost site. Radio-tracked birds roosting at Little Paxton Pits fed on 50% of days at Grafham Water only 5 km away, but did make use of a number of other feeding sites. Birds roosting at Rutland Water fed mostly at Rutland, but did commute to other sites, such as Eyebrook Reservoir. Birds were more faithful to roost sites, but nevertheless still disappeared from the main roost at Paxton for short spells of up to seven nights. The movements of satellite-tracked birds suggested that, on occasions, birds did make substantial feeding flights from the roost, for example to Bartley Reservoir in Birmingham, some 120 km to the west.

At Grafham Water, radio-tracked birds predominantly fed in the shallower western half of the reservoir in summer, including the shallow margins, and made extensive use of onshore loafing sites along the western shore. In winter, they largely fed in the deeper eastern and central portions of the reservoir, and made relatively little use of onshore loafing sites (most birds loafed instead on the surface of the water). The differences in feeding distribution probably relate to seasonal changes in the distribution of fish, which move into deeper water during the winter but return to the surface layers as the water warms in summer.

A count of 1,050 at Queen Mary Reservoir was the highest at any site during the year, whilst counts at Queen Mother Reservoir were well in excess of the five year average and continued the strong increase at this site. Lower than average counts were recorded from the Inner Moray Firth, though numbers at this site often fluctuate widely. The Colne Estuary held less than 100 birds for the second successive year and counts on nearby Dengie Flats also dropped markedly. Large increases, the more notable given the overall decline in numbers, were recorded at Blithfield and Walthamstow Reservoirs, Grafham Water and Rostherne Mere. Other sites holding 130 or more birds in Great Britain were Traeth Bach (257, Sep), Attenborough Gravel Pits (181, Feb), Knight & Bessborough Reservoirs (172, Oct), Sonning Gravel Pits (150, Jan), Dungeness Gravel Pits (144, Oct), and Loch of Strathbeg (143, Jan). In Northern Ireland, Lough Foyle (133, Apr) was the only other site to hold 130 or more birds.

Table 15. CORMORANT: MAXIMA AT MAIN RESORTS

	92-93	93-94	94-95	95-96	96-97	Month	Average
Great Britain							
Morecambe Bay	802	895	793	1,115	977	Sep	916
Forth Est.	747	622	579	806	657	Sep	682
Abberton Rsr	351	700	800	722	800	Apr	675
Inner Moray Firth	167	1,945	624	388	118	Oct	648
Rutland Water	532	800	661	655	391	Oct	608
Solway Est.	764	682	450	639	457	Jul	598
Clyde Est.	565	377	459	464	404	Nov	454
Queen Mary Rsr	124	407	137	387	1,050	Jan	421
Tees Est.	345	181	396	676	471	Aug	414
Dee Est. (Eng/Wal)	313	431	354	460	399	May	391
Poole Hbr	380	368	284	471	375	Sep	376
Lo. Leven	317	297	442	410	405	Dec	374
North Norfolk Marshes	87	1426	398	463	492	Sep	373
Alt Est.	143	455	447	285	514	Nov	369
Grafham Water	270	470	170	310	610	Dec	366
Blackwater Est.	244	501	269	249	348	Dec	322
Wash	211	297	394	348	337	Jul	317
Ranworth/Cockshoot Br.	271	259	462	295	254	Dec	308
Ouse Washes	248	335	244	285	391	Mar	301
Colne Est.	384	676	181	43	65	Mar	270
Hanningfield Rsr	258	240	283	211	223	Sep	243
Thames Est.	207	399	246	205	151	Oct	242
Rostherne Mere	261	369	273	244	55	Apr	240
Walthamstow Rsrs	100	90	130	400	450	Jul	234
Irvine to Saltcoats	260	190	197	250	230	Feb	225
Draycote Water	135	152	347	292	130	Nov	211
William Girling Rsr	186	132	400	200	91	Sep	202
Medway Est.	108	212	212	310	154	Jan	199
Chew Valley Lake	160	220	195	250	170	Nov	199
Swale Est.	161	236	208	174	200	Oct	196

	92-93	93-94	94-95	95-96	96-97	Month	Average
Pagham Hbr	161	199	158	204	246	Feb	194
Queen Mother Rsr	24	45	180	105	600	Nov	191
Ribble Est.	222	175	167	191	179	Sep	187
Dysynni Est.	29	245	141	248	214	Aug	175
Dengie Flats	401	203	72	152	26	Oct	171
Queen Elizabeth II Rsr	70	98	118	169	380	Sep	167
Clwyd Est.	195	82	156	143	255	Aug	166
Ayr to Troon	337	146	115	121	107	Dec	165
Farmoor Rsrs	130	183	97	225	185	Dec	164
Besthorpe/Girton GP	108	79	176	190	262	Jun	163
Carmarthen Bay	131	237	249	60	129	Sep	161
Windermere	174	186	167	137	142	Nov	161
Wraysbury GP	127	70	217	206	169	Dec	158
Exe Est.	238	119	107	123	169	Sep	151
Breydon Water	122	113	187	198	132	Jul	150
Tay Est.	100	96	95	245	212	Sep	150
Wraysbury Rsr	246	69	43	241	142	Oct	148
Chichester GP	104	308	57	54	206	Dec	146
Herne Bay	-	150	140	-	-		145
Stour Est.	145	88	169	157	153	Oct	142
Blithfield Rsr	102	97	90	88	323	Dec	140
Deeping St James GP	142	233	91	93	-		140
Lee Valley GP	75	77	156	231	149	Sep	138
Durham Coast	314	108	68	87	109	Mar	137
Southampton Water	175	120	138	135	100	Oct/Nov	134
Coombe Pool	-	119	233	44	-		132
Humber Est.	181	138	145	75	116	Feb	131
Northern Ireland†							
Lo. Neagh/Beg	1,018	718	631	951	927	Aug	849
Belfast Lo.	380	483	401	536	352	Sep	430
Strangford Lo.	189	259	165	180	167	Oct	192
Carlingford Lo.	167	130	101	244	187	Jan	166
Outer Ards	97	100	177	147	152	Nov	135
Lo. Foyle	120	130	94	122	133	Apr	120
Upper Lo. Erne	111	109	76	162	129	Dec	117
Seaforde Lakes	115	-	-	-	-		115

† *as no threshold has been set for national importance for Cormorant in Northern Ireland, a qualifying level of 130 has been used as the basis for selecting sites for presentation in this report*

‖ *includes a count of roosting birds at Holkham Lake*

GREATER FLAMINGO
Phoenicopterus ruber

Escape

One bird was recorded on the Thames Estuary in March.

LESSER FLAMINGO
Phoenicopterus minor

Escape

One individual was recorded on the Mersey Estuary in January.

CHILEAN FLAMINGO
Phoenicopterus chilensis

Escape

Two birds were seen on the Thames Estuary in autumn (Aug, Sep & Oct) and late winter Feb with just one individual reported in March.

MUTE SWAN
Cygnus olor

International importance: 2,400
Great Britain importance: 260
All-Ireland importance: 55

GB maximum:	**16,570**	**Nov**
NI maximum:	**2,254**	**Jan**

Trend	92-93	93-94	94-95	95-96	96-97
GB	151	162	171	173	178
NI	120	110	133	138	117

The 1996-97 peak count of Mute Swans in Great Britain represents the largest total recorded to date by WeBS, an increase of 6% on the peak count of the previous season. This is mirrored by the indices which have show a sustained increase over the last five years. Despite harsh weather conditions in mid winter, the proportion of the peak count present at the end of the winter remained similar to that of recent years, suggesting no increased mortality. The Northern Ireland peak was slightly below that of 1995-96, though counts at one site, Loughs Neagh/Beg, represent a large percentage of this figure in most months of the year.

Ten sites in Great Britain and eight in Northern Ireland surpass the respective 1% thresholds for national importance. Whilst counts at most sites peak in the autumn months, some, such as at Abberton Reservoir, Montrose Basin and Loughs Neagh & Beg, are typically recorded during gatherings of moulting birds in late summer. In 1996-97, notable counts were recorded on the Somerset Levels, where numbers have steadily increased from 2-300 birds in the early 1990s, and at Upper Lough Erne, where counts reached their highest to date. Counts on the Ouse Washes fell for the third consecutive season to the lowest peak count in almost twenty years whilst low counts at the Loch of Harray mean this site is no longer of national importance based on WeBS Core Count data.

The following sites also held over 260 birds in 1996-97: Stour Estuary (426, Jan), Fen Drayton Gravel Pits (286, Aug), Southport Marina (285, Aug), Linford Gravel Pits (283, Oct), Thames Estuary (277, Dec) and River Tweed: Kelso - Coldstream (271, Oct).

Table 16. MUTE SWAN: MAXIMA AT MAIN RESORTS

	92-93	93-94	94-95	95-96	96-97	Month	Average
Great Britain							
Fleet/Wey	1,126	1,196	1,227	1,151	1,185	Nov	1,177
Somerset Levels	525	511	687	608	731	Nov	612
Ouse Washes	615	923	726	427	364	Dec	611
Tweed Est.	640	720	593	212	664	Jul	566
Abberton Rsr	487	572	624	538	480	Aug	540
Avon Valley (Mid)	357	327	438	476	368	Dec	393
Rutland Water	211	342	280	295	396	Sep	305
Montrose Basin	220	291	297	299	356	Aug	293
Morecambe Bay	199	250	330	285	281	Jan	269
Lo. of Skene	375	404	180	101	-		265
Northern Ireland							
Lo. Neagh/Beg	1,746	1,170	1,683	2,179	1,844	Aug	1,724
Upper Lo. Erne	355	413	456	456	590	Jan	454
Strangford Lo.	118	213	133	98	83	Nov	129
Lo. Foyle	95	80	102	104	130	Nov	102
Dundrum Bay	100	145	103	63	67	Nov	96
Broad Water Canal	6	175	26	-	78	Oct	71
Ballyroney Lake	59	-	-	-	-		59

BLACK SWAN
Cygnus atratus

Escape
Native range: Australia

GB maximum:	**21**	**Aug**
NI maximum:	**0**	

Numbers in the UK continue their apparent increase: birds were recorded at 44 sites in 1996-97, and summing site maxima produced a total of 62 birds. Whilst this is likely to result in a degree of double-counting, especially for such a conspicuous species, the fact that birds at many sites remained for several months in succession suggests that summed site maxima provides a reasonable estimate of the total numbers. Only two held more than two birds: Woburn Park Lakes (10, May) and the Thames Estuary (6, Aug). Most sites were in southern England, though birds were also recorded at six Scottish and one Welsh site.

The above figures compare with records from 32 sites, and summed site maxima of 50 for 1995-96, whilst the species

was found at just 23 sites in 1993-94. Although some of the apparent increase may result simply from better reporting of this species, it would be expected that, five years after the regular recording and reporting of escaped and exotic species, this effect would have begun to plateau, and thus that the increase may be real.

BEWICK'S SWAN
Cygnus columbianus bewickii

International importance: 170
Great Britain importance: 70
All-Ireland importance: 25*
***50 is normally used as a minimum threshold**

GB maximum	**8,443**	**Feb**
NI maximum:	**356**	**Jan**

Trend	**92-93**	**93-94**	**94-95**	**95-96**	**96-97**
GB	**201**	**178**	**141**	**277**	**265**
NI	**45**	**77**	**25**	**36**	**63**

1996-97 saw high numbers of Bewick's Swans in the UK, particularly in the latter half of the winter, and counts in Great Britain and Northern Ireland reached their highest levels since 1991-92, with index values remaining high following the high level of the previous winter. Both the national total and the January value in Table 3 were low due to poor count conditions at the main site, the Ouse Washes, where fog meant that only a small proportion of the swans present was counted. Breeding success was again relatively poor, with around 11-13% young recorded form WWT Centres (WWT, unpubl. data).

The larger number of British sites of international importance than of national importance, reflects the loyalty to a small number of traditionally important areas where birds gather in very large numbers. As in the previous winter, cold weather on the continent brought an influx of birds prior to the February count, with peak counts at most east coast sites recorded during this month. Counts at the Nene Washes showed a continued decline whilst counts at WWT Slimbridge on the Severn Estuary were the highest ever recorded. Sites which held in excess of 70 birds in Britain and 25 or more in Northern Ireland in 1996-97 were as follows: Lower Derwent Valley (139, Feb), Dee Estuary (107, Jan), Abberton Reservoir (70, Nov), Upper Lough Erne (122, Jan) and Boghill Fields (48, Dec).

Table 17. BEWICK'S SWAN: MAXIMA AT MAIN RESORTS

	92-93	93-94	94-95	95-96	96-97	Month	Average
International							
Ouse Washes	5,169	4,172	3,920	4,830	4,610	Feb	4,540
Nene Washes	2,543	1,922	1,913	1,025	863	Feb	1,653
Martin Mere/Ribble Est.	[1]764	[1]582	[1]548	[1]350	322	Dec	513
Breydon Water	268	331	209	752	476	Feb	407
Severn Est.	[1]329	[1]313	253	[1]370	555	Jan	364
Walland Marsh	[2]315	[2]288	-	[2]327	324	Feb	314
St Benet's Levels	173	179	404	391	286	Feb	287
Lo. Neagh/Beg	163	703	90	80	117	Mar	231
Somerset Levels	209	195	119	345	282	Feb	230
Great Britain							
Walmore Common	[1]163	[1]127	127	[1]139	135	Feb	138
Avon Valley (Mid)	170	90	81	118	137	Mar	119
Arun Valley	66	59	68	133	68	Dec	79
Northern Ireland							
Lo. Foyle	59	92	37	94	90	Jan	74
R. Lagan: Flatfield	41	84	-	32	-		52
Canary Road	-	59	-	43	-		51
Strangford Lo.	0	133	0	0	10	Feb	29

1 *from WWT annual swan reports (e.g. Bowler* et al. *1994)*
2 *D. Walker (*in litt.*)*

WHOOPER SWAN
Cygnus cygnus

International importance: 160
Great Britain importance: 55
All-Ireland importance: 100

GB maximum:	**3,963**	**Dec**
NI maximum:	**3,137**	**Mar**

Trend	92-93	93-94	94-95	95-96	96-97
GB	210	186	221	194	278
NI	85	73	82	70	88

Numbers of Whooper Swans in Great Britain reached their highest level since 1990-91, with index values almost 50% above average figures for the 1990s and only fractionally lower than the peak of the late 1980s. In Northern Ireland, numbers were the second highest yet recorded by WeBS, exceeded only by a count of 3,300 in November 1985. Index values were amongst the highest in the 1990s. Breeding success in 1996 was moderate, with 14-16.6% young recorded from WWT Centres.

As with Bewick's Swans, the absence of accurate data for the Ouse Washes in January due to poor visibility affected national totals and monthly fluctuations. Numbers present during each month in Northern Ireland fluctuate much more widely, with sites such as Lough Foyle being used as a key landfall site for newly arrived birds passing through to Britain and Ireland (McElwaine *et al.* 1995) and also receiving birds pushed westwards during cold weather in Scotland and northern England later in the winter.

Since the population is generally more dispersed, a far greater number of sites support nationally and internationally important numbers of Whooper Swans than Bewick's Swans despite similar numbers in the UK as a whole. Counts at Upper Lough Erne continued to grow, surpassing 1,000 birds for the first time, and high numbers were maintained on the Ouse Washes. No counts were received from Loch of Skene, though if numbers were as low as in recent years the site would almost certainly cease to be internationally important. Seven further British sites held 55 or more birds 1996-97: Barons Folly (123, Jan), St Benets Levels (82, Feb), Loch Calder (76, Oct), Whitrig Moss (75, Feb), River Nith: Keltonbank to Nutholm (75, Mar), Merryton Ponds Dalzell (72, Dec), Barons Haugh (68, Dec), Tyninghame Estuary (65, Mar), River Clyde: The Meetings (60, Dec) and Haddo House Lakes (55, Oct). Two Northern Irish sites, Boghill Fields (137, Dec) and Bush River: Deepstown (122, Jan), held peak counts of 100 or more birds.

Table 18. WHOOPER SWAN: MAXIMA AT MAIN RESORTS

	92-93	93-94	94-95	95-96	96-97	Month	Average
International							
Ouse Washes	[1]856	[1]986	[1]1,142	[1]1,288	1,179	Dec	1,090
Lo. Neagh/Beg	883	740	1,102	906	1,169	Jan	960
Lo. Foyle	1,166	569	596	1,521	671	Oct	905
Upper Lo. Erne	612	721	756	980	1,094	Mar	833
Martin Mere/Ribble Est.	[1]666	[1]650	[1]738	[1]740	802	Jan	719
R. Foyle: Grange	-	297	(12)	266	380	Mar	318
Solway Est.	[1]200	175	[1]176	[1]198	182	Mar	186
Lo. of Strathbeg	140	302	75	221	158	Jan	179
Lo. Eye/Cromarty Fth	[2]389	72	190	76	117	Oct	169
Lo. of Skene	425	243	0	8	-		169
Great Britain							
Solway Est.	94	162	81	58	217	Dec	122
Lo. of Wester	-	187	49	-	98	Mar	111
Black Cart Water	-	262	0	110	56	Nov	107
Lo. of Spiggie	141	-	84	180	7	Apr	103
Lo. Leven	127	99	96	94	97	Dec	103
Lo. Insh & Spey Marshes	-	0	200	115	82	Dec	99
R. Tweed: Kelso to Coldstream	139	137	75	88	48	Mar	97
Wigtown Bay	105	75	98	72	59	Mar	82
R. Teviot: Kalemouth to Roxburgh	80	-	-	-	-		80
Islesteps	71	74	-	-	-		73
R. Tweed: Magdalenehall	-	-	70	-	-		70
Merryton Ponds	63	72	72	67	-		69
R. Teviot: Nisbet to Kalemouth	82	58	68	95	31	Nov	67
Cromarty Fth	5	12	190	13	101	Jan	64
Rutherford	7	102	-	110	36	Nov	64
Lo. of Skaill	18	21	104	95	78	Oct	63
Milldam & Balfour Mains Pools	58	60	57	46	87	Nov	62
Lower Derwent Valley	61	22	73	42	96	Dec	59
Vow Meadows	48	73	57	73	39	Jan	58
Easterloch/Uyeasound	57	-	-	-	-		57
East Fortune Ponds	48	96	63	20	50	Feb	55
Lo. of Lintrathen	47	24	136	1	67	Jan	55

	92-93	93-94	94-95	95-96	96-97	Month	Average
Northern Ireland							
R. Lagan: Flatfield	95	89	-	135	-		106

1 *from WWT annual swan reports (e.g. Bowler* et al. *1994)*
2 *R.J. Evans* (in litt.)

SWAN GOOSE
Anser cygnoides

Escape
Native range: Eastern Asia

GB maximum: **26** **Sep**
NI maximum: **0**

This species was recorded at eight sites in 1996-97, generally in small numbers, though there were maxima of 15 at Esthwaite Water and eight at Etherow Country Park, both in September.

BEAN GOOSE
Anser fabalis

International importance: **800**
Great Britain importance: **4*†**
All-Ireland importance: **+***
***50 is normally used as a minimum threshold**

GB maximum: **228** **Feb**
NI maximum: **0**

Trend **not available**

Birds at the two traditional wintering sites, the Yare Valley in Norfolk and Carron Valley in Central, are only sporadically detected by WeBS counts, and hence additional data is presented in the table below to reflect more adequately the importance of these areas. The Great Britain peak of 228 birds includes a large percentage of the Carron Valley flock, though relatively few of the birds along the Yare, preventing comparison of annual WeBS totals between years with any confidence. As during last winter, there was a small influx of birds, along with White-fronted Geese, to east coast sites during February, though involving fewer birds than in 1995-96, as a result of cold weather on the near continent between the January and February count dates. As reported in birdwatching magazines, many of these birds were of the *rossicus* race; flocks at the regular British haunts comprise *fabalis* birds.

Just three sites not listed in the table below recorded ten or more birds: Lower Derwent Valley (18, Dec), Dungeness Gravel Pits (15, Feb) and Walland Marsh (15, Feb).

Table 19. BEAN GOOSE: MAXIMA AT MAIN RESORTS

	92-93	93-94	94-95	95-96	96-97	Month	Average
Great Britain							
Middle Yare Valley	350	[1]305	[1]310	[1]195	[1]224	Nov	277
Slamannan Plateau	[2]126	[3]135	[2]132	[2]123	[2]127		129
Heigham Holmes	24	365	8	103	0		100
Lo. Ellrig	-	-	0	0	100	Feb	33
North Warren & Thorpeness Mere	3	0	13	48	36	Feb	20
Ouse Washes	3	25	1	2	34	Feb	13

† *as the 1% threshold for national importance in Great Britain is so small, a qualifying level of 10 has been used as the basis for selecting sites for presentation in this report*
1 *RSPB, pers. comm.*
2 *data from Bean Goose Working Group annual reports, e.g. Simpson & Maciver (1997)*
3 *Smith* et al. *(1994)*

PINK-FOOTED GOOSE
Anser brachyrhynchus

International importance: **2,250**
Great Britain importance: **2,250**
All-Ireland importance: **+***

GB maximum: **234,379** **Oct**
NI maximum: **28** **Mar**

Trend	92-93	93-94	94-95	95-96	96-97
GB	275	312	362	279	326

Following the low total of the previous winter, numbers in 1996-97 rose again, though remaining below the record count in 1994-95 (Mitchell 1997). Five-year running means show the population to have stabilised at around 225,00

since the early 1990s, following the dramatic increase during the previous decade. These annual changes are perhaps most influenced by breeding success (Figure 9).

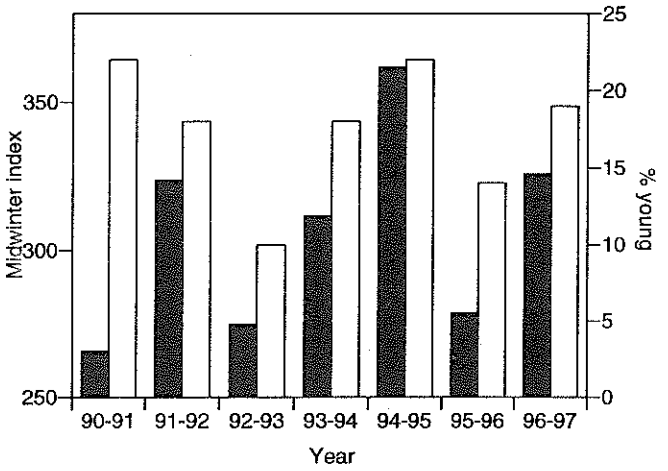

Figure 9. The population index and proportion of young in Pink-footed Geese, 1990-91 to 1996-97.

The overall proportion of 18.8% young in autumn flocks in 1996 represented a year of reasonably good breeding success, with mean brood size of 2.4 young per pair also reasonably high.

Despite the high national totals, there were no especially large counts at individual sites in 1996-97 and those at four of the top six sites were below their five year mean. Nevertheless, record counts were made at several sites, including Southwest Lancashire, Morecambe Bay, Tay Estuary and Drummond Pond, whilst Wigtown Bay sustained high numbers following the increase in recent years. Conversely, very low counts were made at Cameron Reservoir and Aberlady Bay, whilst no birds were recorded for the second year in succession at Glenfarg Reservoir, presumably as a result of the extended season for fishing from boats. Other sites holding 2,250 or more birds were Haddo House Lakes (4,200, Oct), Loch Mahaick (2,700, Oct), Heigham Holmes (2,400, Jan/Feb), River Clyde: Lamington (2,300, Oct) and Cuthlie (2,400, Nov).

Table 20. PINK-FOOTED GOOSE: MAXIMA AT MAIN RESORTS[1]

	92-93	93-94	94-95	95-96	96-97	Month	Average
International							
Lo. of Strathbeg	30,650	38,970	58,150	48,500	32,000	Oct	41,654
Dupplin Lo.	25,500	36,500	62,000	35,000	40,500	Oct	39,900
Snettisham	33,070	45,925	31,038	39,130	35,930	Dec	37,019
SW Lancashire	32,800	27,260	31,000	28,850	41,680	Jan	32,318
West Water Rsr	25,000	40,000	26,500	31,500	25,500	Oct	29,700
Montrose Basin	35,000	41,210	36,000	18,500	17,150	Jan	29,572
Holkham	9,150	26,760	16,000	19,230	26,000	Dec	19,428
Lo. Leven	23,070	18,870	16,154	17,900	18,150	Oct	18,829
Slains Lo./Ythan Est.	4,360	23,880	21,400	25,000	17,400	Oct	18,408
Solway Est.	12,567	17,470	20,202	20,523	11,546	Mar	16,462
Scolt Head	15,200	16,860	13,150	15,635	17,900	Jan	15,749
Hule Moss	15,880	14,100	8,100	15,200	19,400	Oct	14,536
Cameron Rsr	15,477	27,300	14,860	11,260	3,460	Nov	14,471
Carsebreck/Rhynd Lo.	8,000	7,120	14,500	13,500	12,000	Oct	11,024
Aberlady Bay	7,000	26,000	5,750	11,320	4,650	Nov	10,944
Wigtown Bay	3,009	3,530	5,912	7,229	7,280	Mar	5,392
Cowgill Rsr	6,700	5,400	3,820	4,560	6,060	Oct	5,308
Alloa Inch	-	-	2,300	6,700	-		4,500
Fala Flow	4,800	6,450	3,500	2,437	5,000	Oct	4,437
Loch of Kinnordy	4,630	9,195	3,420	434	2,730	Nov	4,082
Morecambe Bay	3,009	2,229	687	5,503	8,671	Mar	4,020
Tay Est.	2,800	(300)	1,938	6,117	8,897	May 97	3,890
Gladhouse Rsr	2,300	2,500	4,550	3,290	6,200	Oct	3,768
Lo. Eye/Cromarty Fth	800	2,797	5,816	7,150	1,500	Nov	3,613
Lo. Tullybelton	5,800	4,100	1,800	1,395	4,658	Oct	3,551
Glenfarg Rsr	4,800	3,800	9,080	0	0		3,536
Crombie Rsr	3,500	3,000	-	-	-		3,250
Forth/Teith Valley	1,000	360	7,780	-	-		3,047
Drummond Pond	3,000	2,550	2,250	110	7,000	Oct	2,982
Tay/Isla Valley	712	3,820	3,202	2,785	2,911	Oct	2,686
Castle Lo. (Lochmaben)	3,000	4,000	(1)	800	(5)	Dec	2,600
Skinflats	2,596	2,051	2,100	3,070	1,560	Feb	2,275

1 *includes data from Paul Fisher* (in litt.)
2 *includes data from Lancashire Goose Report (e.g. Forshaw 1995)*

EUROPEAN WHITE-FRONTED GOOSE
Anser albifrons albifrons

International importance: 6,000
Great Britain importance: 60
All-Ireland importance: +*

GB maximum:	**7,029**	**Feb**
NI maximum:	**0**	

Trend	**92-93**	**93-94**	**94-95**	**95-96**	**96-97**
GB	**13**	**44**	**32**	**33**	**39**

The peak count of European White-fronted Geese in Great Britain passed 7,000 for the first time in a decade, with a notable influx of around 3,000 birds between the January and February counts. Monthly fluctuations, which take account of variable levels of coverage at sites (Table 3), suggest a relatively early arrival, with over half the peak already present by mid December. Although index values showed an upturn compared with recent winters, the 1995-96 figure remains below nearly all values of the previous three decades. Breeding success in 1996 was similar to that in recent years, with 20% young and mean brood size of 3.09 birds per pair in the flock at WWT Slimbridge.

Numbers in Great Britain are small compared with the large numbers in continental Europe, particularly The Netherlands. Mooij (1997) suggests that despite the increase in counted numbers in western Europe since the 1950s, there is no strong evidence to indicate of a large increase in the Western Palaearctic population as a whole, and that redistribution of wintering focal points away from central and eastern Europe may be a factor in this apparent growth.

Partly as a result of relatively large numbers at many sites in the last two winters in particular, the number of sites in Table 21 has grown, whilst those with average maxima of over 100 have increased from eight in 1995-96 to 13. Notable counts were received from Dungeness Gravel Pits, Minsmere and, for the second winter in succession, from the Alde complex. By contrast, both sites in the Avon valley have dropped from the list, as a result of successive low counts, suggesting that birds have all but departed this area as a regular wintering haunt. The Crouch-Roach Estuary (60, Dec) was the only other site to record numbers in excess of the current threshold for national importance in 1996-97.

Table 21. EUROPEAN WHITE-FRONTED GOOSE: MAXIMA AT MAIN RESORTS

	92-93	93-94	94-95	95-96	96-97	Month	Average
Great Britain							
Severn Est.	1,401	3,000	2,200	2,170	2,780	Feb	2,310
Swale Est.	900	1,703	1,681	2,088	1,604	Feb	1,595
Heigham Holmes	350	163	185	1,043	640	Feb	476
North Norfolk Marshes	567	316	248	476	491	Mar	420
Walland Marsh	-	-	-	[1]300	328	Feb	328
North Warren/Thorpeness Mere	66	120	47	450	302	Feb	197
Middle Yare Marshes	238	265	189	[1]80	47	Nov	173
Breydon Water	539	80	88	64	69	Feb	168
Alde Complex	40	19	0	427	317	Jan	161
Lower Derwent Valley	201	7	1	244	114	Feb	113
Dungeness GP	11	174	0	8	355	Feb/Mar	110
Wash	0	483	0	38	21	Feb	108
Thames Est.	122	103	107	59	146	Feb	107
Minsmere	9	69	64	83	215	Feb	88
Kessingland Levels	78	-	-	-	-		78
Ouse Washes	38	106	16	88	76	Mar	65

1 *D. Walker (in litt.)*

GREENLAND WHITE-FRONTED GOOSE
Anser albifrons flavirostris

International importance: 300
Great Britain importance: 140
All-Ireland importance: 140

GB maximum:	**20,851**	**Nov**
NI maximum:	**188**	**Jan**

Trend	**92-93**	**93-94**	**94-95**	**95-96**	**96-97**
GB	**127**	**142**	**160**	**179**	**173**
NI	**95**	**75**	**97**	**128**	**120**

The peak count of the annual autumn and spring censuses of Greenland White-fronted Geese was lower than that of the previous winter, representing only the second decrease since monitoring began in 1982-83 (Fox & Francis 1997). The lower than expected totals in 1996-97 are attributed to particularly poor breeding success, with only 7.14% young and mean brood size 3.01 birds per pair. This is thought to have been linked to unusual and very cold weather in late summer in Greenland, with snow at relatively low altitudes in some areas. There was also a decline in the Republic of Ireland (D. Norriss pers. comm.), though the small numbers here fluctuate to a greater extent. This deviation

from the normal increase of 8-9% each year mirrors the situation in 1992-93, when poor breeding success resulted in a 6% decline in British numbers (Fox *et al.* 1994). The peak WeBS count in Northern Ireland was, unusually, higher than either of the co-ordinated census totals, with both of the regular flocks at Loch Mcnean and Caledon located during WeBS counts, though birds from the latter site had moved to Stagrane on the River Blackwater. The totals presented in this report for the province do not include birds at Pettigo plateau or on the Foyle Estuary: although these flocks span the border, the birds at these sites are included in the Republic of Ireland totals for simplicity.

The decline was most apparent on Islay, although the peak remained above the five year mean and at most other sites, numbers were similar to those of recent years. In the Republic of Ireland, the decline was also most apparent at the key site, Wexford, whilst numbers on the remaining sites were similar to or higher than the previous year (D. Norriss pers. comm.). Conversely, large numbers were recorded at Machrihanish and particularly on Tiree, the second successive year of high counts there. The only other sites to hold more than 140 birds were Clachan (184, Nov) and Loons/Loch of Isbister (160, Jan), although flocks of 500 and 600 were noted on passage past the Uists in mid April.

Regular monitoring of all known wintering sites began in 19982-83, at the same time that the population was afforded protection from hunting, though regular counts of eight flocks, including the two key areas of Islay and Wexford, Ireland, exist prior to this date also (Fox *et al.* 1998). Five showed no trend prior to protection but increases afterwards, two showed increases before followed by stable numbers, and one showed increases both before and after protection. Evidence from Islay shows that crude survival, based on census statistics, has increased significantly since protection; the data from Wexford show no such trend, although previous analysis had shown that adult survival was inversely related to the hunting bag. Despite protection and an overall increase in the population, seven flocks have become extinct between 1992 to 1995, five more are close to extinction, and 18 have declined. Since birds the birds in an individual wintering flock winter are drawn from no well defined summer area, the changes in numbers are more likely to reflect factors operating on the winter areas. The size, number and quality of feeding areas, disturbance, flock size and latitude influence flock status; smallest, most southerly flocks on fewest, poor quality limited feeding ranges, show the most serious declines.

Table 22. GREENLAND WHITE-FRONTED GOOSE: MAXIMA AT MAIN RESORTS+

	92-93	93-94	94-95	95-96	96-97	Month	Average
International							
Islay[1]	10,905	11,368	12,350	14,495	12,964	Nov	12,416
Machrihanish	1,110	1,103	1,044	1,339	1,629	Mar	1,245
Rhunahaorine	726	1,050	1,361	1,360	1,272	Mar	1,154
Coll	438	896	1,026	962	1,047	Nov	874
Tiree	418	499	512	1,387	1,455	Nov	854
Stranraer Lo.	550	565	565	550	535	Apr 97	553
Danna/Keills	288	308	381	414	333	Jan	345
Lo. Ken	323	325	293	360	318	Feb	324
Great Britain							
Appin/Eriska/Benderloch[2]	112	323	336	376	217	Nov	273
Westfield Marshes	190	196	206	352	210	Mar	231
Lo. Lomond: Endrick Mouth	250	137	230	230	245	Mar	218
Bute	130	213	226	210	224	Apr 97	201
Lo. Heilen/Lo. Mey	160	180	196	258	199	Feb	199
Colonsay/Oronsay	195	150	185	206	169	Dec	181
Jura	(20)	-	148	160	140	Jan	149
Dyfi Est.	134	160	155	147	125	Mar	144
Linne Mhuirich/ Lo. Na Cille[2]	284	0	-	-	-		142

\+ *based largely on data from GWGS reports (e.g. Fox & Francis 1997)*

1 *data represent SNH 'adopted' counts: whole-island counts are made on two consecutive days and the average taken, unless one count is deemed inaccurate due to operational difficulties. Note that figures presented here may differ from those previously published*

2 *probably significant numbers of the same birds moving between these sites*