

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, 1989-90 to 1993-94. Peak counts, where available, are given for each of the last five seasons, and the month in which the peak 1993-94 count occurred at each site is given in the column labelled 'Mth'. A dash '-' indicates a missing count and incomplete counts are bracketed. In the first instance, average maxima were calculated using only complete counts but, if any incomplete counts exceeded this initial average, they were then also incorporated and the averages recalculated. Averages enclosed by brackets are based solely on incomplete counts. A cross '+' denotes counts made during WWT and other goose surveys. Other sources of information are cited accordingly. In wader accounts, non-estuarine coastal sites are identified by an asterisk '*' and inland sites are identified by a hash '#'. Notably high or low counts and any consistent increases or declines in numbers at individual sites are highlighted in the text.

In accounts for divers, grebes, Cormorant, herons, wildfowl and Kingfisher, seasonal maxima are derived from any of the months July 1993 to March 1994. The tables presented in the wader accounts include data from only the winter period, November 1993 to March 1994, although the text includes reports of sizeable counts from any part of the year, especially for species with important passage populations. The range of months used for deriving maxima for gulls was October 1993 to March 1994, as only from October were gulls included on all count forms. As summer and passage visitors, data from July 1993 to October 1993 only are presented for terns. The use of different months for the derivation of maxima is given in the table headings for each species.

Several species have only recently been included in WeBS. Where three seasons' data are now available, these have been provided as tables and average seasonal maxima calculated. This approach is in line with the recommendation of the Ramsar Convention that at least three years' data are used in the evaluation of the international importance of sites using averages of seasonal maxima. Whilst at least five years' data are normally used in such evaluations, averages based on three or four years data may be used in provisional assessments. As national coverage of herons, gulls, terns and Kingfisher only began with the launch of WeBS, only 1993-94 maxima are presented for these species.

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 level is less than 50 birds, 50 is normally taken as the minimum qualifying level. 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 qualifying levels 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. As no 1% thresholds for national importance have been derived for non-breeding herons, gulls, terns and Kingfisher, the ten sites with the highest peak counts in 1993-94 are listed for each species.

In the wildfowl accounts, all sites which, in 1993-94, held nationally important numbers, or numbers exceeding the adopted threshold, but which currently have five year means less than 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 1988-89 to 1992-93, as presented in Wildfowl and Wader Counts 1992-93. The locations of sites mentioned in the species accounts are given in Appendix 2.

National Context

The national totals (from Tables 1 & 2) and the yearly index values for the last five winters, where calculated (from Tables 5, 6 & 7), are repeated here 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.

Qualifying Levels

The 1% thresholds for International, Great Britain and all-Ireland populations are given for each species, except where these are unknown (indicated using a question mark '?'), where the population is too small for a meaningful figure to be obtained (indicated using a plus '+'), where the population is derived from introduced, escaped or feral birds (indicated using 'introduced') or where the species is scarce or a rarity in

the UK (indicated using 'scarce'). These values are used to identify sites of importance which qualify for designation under international and national legislation and conventions. However, it should be noted that, where the 1% threshold is less than 50 birds, 50 is normally taken as the minimum qualifying level. An asterisk '*' has been used to highlight these instances (see Appendix 1 for a full explanation of national and international qualifying criteria).

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 urgent need for counting to be resumed at these sites.

It should be recognised that, in using a cut-off of national importance, this report provides only 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 important because of the assemblage of species present are not included here. European Directives and international conservation conventions stress the need for a holistic approach to effect successful conservation, and lay great importance on maintaining the distribution and range of a species, in addition to the conservation of individual key sites.

Recent Research

A summary of key findings from 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, changes in legislation etc.

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. All species are listed in Voous order.

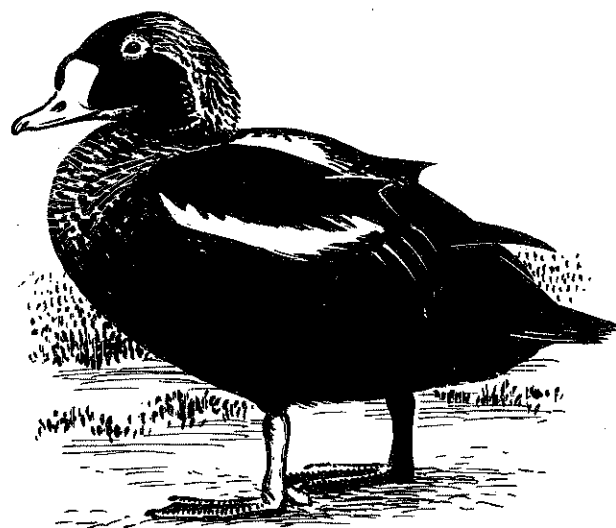
Key to symbols commonly used in the species accounts

In tables of important sites:

- No data available.
- Incomplete count.
- + Data from WWT and other goose surveys (goose accounts only).
- * Non-estuarine coastal sites (in wader accounts only).
- # Inland sites (in wader accounts only).

As footnotes to international and national qualifying levels:

- ? 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 qualifying level 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 qualifying level

GB maximum: 473 Nov**NI maximum: 27 Feb****Trend****not available**

In general, higher numbers were recorded throughout 1993-94 in Great Britain compared with the two previous winters. The peak count, however, was lower and, curiously, the count in December (218) was particularly low, especially since this month has seen the largest numbers in recent seasons, when high counts at Minsmere have made the major contribution to national totals. Numbers in Northern Ireland were down on recent years and counts in the first half of 1993-94 were especially low, presumably due to poor counting conditions. Cardigan Bay is consistently the best site in the UK, with 284 birds recorded off the Dyfi Estuary alone in January. Away from Cardigan Bay and the Moray Firth, there were no particularly large counts of Red-throated Divers and, apart from the sites in Table 8, the Outer Ards (10, January) was the only site that supported numbers reaching national qualifying levels in 1993-94.

The results of aerial surveys of the UK coastline in the 1980s and 1990s show divers to be mainly winter visitors to our shores, favouring northern areas (Barton *et al.* 1993, 1994a, 1994b). However, the Wash and Thames were also shown to support relatively high densities of birds at particular times. Land-based counts from the Kent coast have confirmed large numbers of Red-throated Divers in the Thames, with another large flock

frequenting the Channel coast (Davenport 1992). Counts from 1978-79 to 1990-91 recorded average maxima of 763 birds in the Thanet and Sheppey area, with up to 1,403 being seen on one occasion. Numbers recorded in the Channel rose during the same period, with average winter maxima of 482 off Dungeness in the late 1980s. In scrutinising county bird reports for southwest England, Lock & Robins (1994) have shown that an average of 100 birds were regularly found off Hartland Point, north Devon, during the 1980s.

Ringling studies of birds breeding in Shetland showed that males bred very close to the site at which they were raised, moving on average only 2 km, whereas females dispersed widely, moving 38 km (O'Kill, 1992). Breeding birds were generally faithful to the site used the previous year. In Canada, Eberl & Picman (1993) examined the effect of distance from the sea on nesting success. Red-throated Divers breed on inland waters, flying to the coast to feed. Birds nesting more than 9 km from the coast were less successful in rearing two young. Adults were required to spend more time on foraging flights, reducing the number of fish fed to the chicks which presumably died from starvation. Birds nesting earlier in the year were subject to higher nest predation but successful pairs raised broods of two chicks more often than birds which nested later.

Table 8. RED-THROATED DIVER: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Great Britain							
Cardigan Bay	-	†994	†495	†390	†740	(Feb)	655
Moray Firth	-	-	††248	††350	††411	(Feb)	336
Minsmere Levels	-	-	213	318	50	(Jan)	194
Dengie Flats	-	-	150	175	89	(Jan)	138
Forth Est.	-	-	101	63	83	(Nov)	82
North Norfolk Marshes	-	-	26	59	67	(Jan)	51
Northern Ireland							
Belfast Lo.	-	-	24	13	20	(Mar)	19
Lo. Foyle	-	-	2	34	15	(Feb)	17

† Data from Friends of Cardigan Bay, e.g. Green & Elliott (1993)

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

BLACK-THROATED DIVER
Gavia arctica

International importance: 1,200

Great Britain importance: 7*

All-Ireland importance: 1*

*50 is normally used as a minimum qualifying level

GB maximum: 25 Feb
NI maximum: 0

Trend not available

Only a very small proportion of the British total has ever been recorded by WeBS, the largest count being 29 in 1992-93. Counts for WeBS in 1993-94 remained on a par with previous seasons, although the Forth Estuary (7, November) was the only site that held seven or more birds. By contrast, RSPB/BP surveys of sea-duck in the Moray recorded much higher than usual numbers, the count in October being particularly noteworthy. WeBS counts in Northern Ireland have yet to turn up a Black-throated Diver, 1993-94 having drawn another blank.

Most divers winter offshore in waters 5 to 30 m deep (Durinck *et al.* 1994), making accurate counts from land difficult. The best estimates of numbers are provided by counts from ships, although separating Red- and Black-throated Divers under such conditions is problematic at best and often impossible. Comprehensive coverage of key areas in the Baltic Sea has allowed the north-west European total of these two species combined to be estimated at 110,000 birds (Durinck *et al.* 1994), with over half of these in the Baltic itself. Most of the remaining birds are found in the eastern part of the North Sea, with

only about 8,000 birds around the coast of the British Isles. Lock & Robins (1994), examining county bird reports, found the south Cornwall coast to be important for Black-throated Divers, especially the mouth of the Fal Estuary and Gerrans Bay, the latter site supporting an average of 59 birds with a peak of 98 during the 1980s.

There are about 150 territorial pairs of Black-throated Divers in the UK (Campbell 1993), all of which are in Scotland. Mudge & Talbot (1993) investigated breeding success in western Highland and found an average of 0.23 and 0.29 young per pair in two study areas. Only 43% of pairs managed to hatch a clutch each year, with a high failure rate (64%) in the first four weeks of incubation. Nearly half of the losses were attributable to predation and almost a third to water level changes. A large proportion was also due to human influences, with an estimated 5% as a result of human disturbance and 13% due to egg collectors. These figures suggest Scottish birds raise only half the number of young required to maintain a stable population, based on calculations from a study in Sweden.

Table 9. BLACK-THROATED DIVER: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Great Britain							
Moray Fth			+ 20	+13	+ 53	(Oct)	29
Machrie Bay	-	-	9	12	0		7

† 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 qualifying level

GB maximum: 48 Dec
NI maximum: 6 Jan

Trend not available

Total numbers in Northern Ireland were much lower than the peaks of 20 and 40 birds recorded in the last two winters. Notably, no birds were recorded at the two main sites for Great Northern Diver, although sea and weather conditions at the time of the count strongly influence the numbers of birds seen. Total numbers in Great Britain were similar to counts in previous seasons, although counts of over 10 birds were only made from November to February. Great Northern Divers favour

northern and western coasts in the UK, especially the northern and Hebridean islands (Parrack 1986), as is reflected in Table 10. The count at Minsmere is particularly interesting in this respect. Although no site reaches national importance, it is evident that a number of sites are regularly favoured by reasonable numbers of birds. The Outer Ards was the only other site to support five or more birds in 1993-94, with five there in January.

Table 10. GREAT NORTHERN DIVER: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Great Britain							
Lo. na Keal	-	-	27	-	-		27
Moray Firth	-	-	††17	††40	††17	(Feb)	25
Lo. Indaal	-	-	22	21	8	(Jan)	17
Minsmere Levels	-	-	0	0	15	(Dec)	5
Lo. Beg/Scridain	-	-	6	5	5	(Dec)	5
Northern Ireland†							
Dundrum Bay	-	-	20	40	0		20
Lo. Foyle	-	-	10	29	0		13

† as no site in the UK is of national importance for Great Northern Diver, a threshold of five has been used as the basis for selecting sites for presentation in this report.

†† RSPB/BP studies (e.g. Stenning 1994)

PIED-BILLED GREBE

Podilymbus podiceps

Scarce

GB maximum: 1 Jul/Aug/Sep/Feb

NI maximum: 0

This North American grebe is a rare visitor to the UK, with just 16 records since 1958 (Rogers *et al.* 1994). However, birds that make the journey successfully often

remain at the same site for a considerable time. A bird at Druridge Pool was recorded from July to September and another was seen at Stithians Reservoir in February.

LITTLE GREBE

Tachybaptus ruficollis

International importance: ?

Great Britain importance: 30*

All-Ireland importance: ?

*50 is normally used as a minimum qualifying level

GB maximum: 2,817 Oct

NI maximum: 712 Oct

Trend	89-90	90-91	91-92	92-93	93-94
GB	320	332	310	296	356
NI	406	338	364	397	426

Numbers in Great Britain have gradually increased over the last few winters, with the peak count approximately 8% higher than 1992-93. Although this was well below the record count in 1990-91, indices suggest that numbers were higher in 1993-94 than at any time since the species was first recorded. The Northern Ireland total was slightly lower than in previous seasons, although indices again suggest an growth in numbers. Little Grebes are susceptible to harsh conditions (Moss & Moss 1993) and the species will have undoubtedly benefited from the continuing run of mild winters.

Loughs Neagh & Beg, which hold well over half of the birds recorded in Northern Ireland in many of the winter months, remain by far the most important site in the UK. Counts on the Thames Estuary remained high for the second year running, whilst the exceptional peak count at Holme Pierrepont Gravel Pits in September reflects the site's rapidly growing importance for the species. Most other sites held numbers close to their respective five year averages. Other sites holding 30 or more birds

in 1993-94 were the Tees Estuary (47, August), Kingsbury Water Park/Coton Pools (40, September), Rye Meads Sewage Farm (34, September), Lothing Lake & Oulton Broad (32, February), Portsmouth Harbour (32, October), Colwick Country Park (32, December) and Cemlyn Bay (32, January).

Research by Fox (1994b) on the feeding ecology of Little Grebes wintering on the Dyfi Estuary suggests that they enjoyed greatest feeding success at slack tides and in shallow water. The birds often fed on newly flooded mudflats on rising tides and ceased feeding once water depth rose to more than 2.7 metres. The decline in time spent roosting during the shortest midwinter days suggests that Little Grebes need to feed for 7-9 hours per day throughout the winter.

Table 11. LITTLE GREBE: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Great Britain							
Thames Est.	104	88	108	182	160	(Jan)	128
Chew Valley Lake	83	100	80	83	75	(Aug)	84
Swale Est.	71	108	94	65	83	(Oct)	83
Deben Est.	84	87	69	48	75	(Dec)	75
Wash	55	109	48	60	92	(Nov)	73
R. Soar: Leicester	67	68	64	43	-		61
Kings Mill Rsr	40	46	64	70	68	(Sep)	58
Holme Pierrepont GP	4	7	45	95	127	(Sep)	56
Avon Valley (Mid)	48	69	38	51	67	(Sep)	55
Medway Est.	60	57	53	49	51	(Dec)	54
Morecambe Bay	86	41	36	30	46	(Jan)	48
R. Test: Fullerton-Stockbridge	-	-	39	63	43	(Feb)	48
Chichester Hbr	52	49	53	36	35	(Dec)	45
Rutland Water	69	40	27	15	68	(Sep)	44
Fleet/Wey	26	44	42	46	41	(Nov)	41
Eversley Cross/Yateley GP	55	46	37	40	19	(Aug)	39
North Norfolk Marshes	18	34	36	34	58	(Sep)	36
Southampton Water	50	23	33	25	42	(Nov)	35
Hamford Water	(0)	52	9	21	52	(Jan)	34
Cameron Rsr	27	19	54	18	40	(Sep)	32
Northern Ireland							
Lo. Neagh/Beg	480	324	324	442	399	(Oct)	394
Strangford Lo.	103	122	105	134	123	(Oct)	117
Upper Lo. Erne	57	67	49	27	54	(Nov)	51

GREAT CRESTED GREBE***Podiceps cristatus***

International importance: ?

Great Britain importance: 100

All-Ireland importance: 30*

GB maximum: 8,965 Oct

NI maximum: 1,542 Mar

Trend	89-90	90-91	91-92	92-93	93-94
GB	130	128	124	140	138
NI	92	80	93	117	74

Numbers of Great Crested Grebes in Great Britain have remained fairly constant during the last few seasons, counts in 1993-94 being about average. Monthly fluctuations show a steady decrease from a September high, though with a slight peak in January (Table 3). Total counts in Northern Ireland are more variable between years, with 1993-94 being slightly lower than the last two seasons. Monthly values fluctuate quite considerably as the key concentrations are found at coastal sites where counting is often hampered by weather conditions.

The key site in the UK, Loughs Neagh & Beg, held unusually low numbers throughout the winter and the lowest since WeBS counts began in Northern Ireland in 1985-86. The count at Chew Valley Lake was the highest recorded by the scheme at this site. Most other sites held average numbers, although some of the southeastern estuaries recorded peaks considerably below average. Fluctuating counts on the Dyfi refer to the presence or absence of counts of birds on the sea along a stretch of coast near Borth. Other sites supporting more than 100 Great Crested Grebes in

Great Britain in 1993-94 were Colwyn Bay (162, October), Draycote Water (144, November), Ardleigh Reservoir (111, September), Avon Valley (Mid) (101, September) and Farmoor Reservoir (101, December). Counts of the Lavan Sands and adjacent coast by CCW in late summer have shown this area to be an important moult site (Mike Howe in litt.). Numbers are usually much smaller in winter and it is possible that these birds have moved into Cardigan Bay by this time. No sites in Northern Ireland, other than those in Table 12, held over 30 birds.

As with any birds on the sea, ideal weather and tidal conditions are needed if accurate counts are to be made. The impressive count made off Lade Sands was the first to be received for WeBS from this site. Opportunistic counts, however, suggest that the site's importance is well established (Davenport 1992), with an average midwinter peak of 279 birds in this area. Opportunistic counts elsewhere in Kent have shown a large number of birds to be found in coastal waters at other sites, notably mean winter peaks of 477 off the Swale and 233 on the Medway. Such counts would

elevate the standing of these sites in Table 12, making the Swale the seventh most important UK site.

A study of ringing recoveries of Great Crested Grebes in Europe showed that the growth in the number of breeding birds has been accompanied by an increasing tendency of birds to winter locally (Adriaensen *et al.* 1993). The research, based mainly on Dutch ringed birds, showed that fewer grebes now migrate to traditional wintering grounds in central Europe, southern areas of the former Soviet Union and southern

North Sea coasts. More localised wintering seemed to be advantageous since these birds established territories earlier, reared more broods and consequently fledged more young than their migratory relatives. Although only a small amount of data was available, recoveries of young birds suggested that this change in wintering habits may be evolutionary, reflecting genetic changes in the population caused by extensive man-made habitat changes (the creation of new lakes) and a strong selective advantage for locally overwintering individuals.

Table 12. GREAT CRESTED GREBE: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Great Britain							
Rutland Water	544	1,038	878	720	894	(Oct)	815
Forth Est.	849	524	678	920	671	(Feb)	728
Lade Sands	-	-	-	-	580	(Jan)	580
Chew Valley Lake	490	440	550	520	675	(Sep)	535
Queen Mary Rsr	360	526	359	349	411	(Dec)	401
Grafham Water	264	744	522	180	181	(Jan)	378
Cardigan Bay	-	†385	†376	†322	†229	(Feb)	328
Morecambe Bay	236	229	332	353	348	(Jan)	300
Colne Est.	322	214	207	614	40	(Oct)	279
NE Kent/Thanet	-	-	200	339	250	(Jan)	263
Lavan Sands	††408	††50	††270	††273	††275	(Aug)	255
Dyfi Est.	(4)	190	(4)	(4)	278	(Dec)	234
Stour Est.	322	200	161	187	250	(Oct)	224
Cotswold WVP West	184	180	200	223	214	(Sep)	200
Hanningfield Rsr	142	186	233	117	298	(Dec)	195
Pitsford Rsr	142	243	243	141	172	(Nov)	188
Abberton Rsr	303	161	63	247	55	(Nov)	166
Medway Est.	254	183	110	135	72	(Dec)	151
Blithfield Rsr	66	233	166	122	115	(Aug)	140
Dengie Flats	67	34	312	253	12	(Feb)	136
Mersey Est.	112	90	58	277	139	(Oct)	135
Attenborough GP	144	142	108	120	134	(Aug)	130
Wraysbury Rsr	241	113	87	70	114	(Sep)	125
Wraysbury GP	108	104	67	156	178	(Jan)	123
Alton Water	151	119	93	142	107	(Oct)	122
Eyebrook Rsr	120	164	112	146	38	(Sep)	116
Wash	96	120	112	55	140	(Aug)	105
Northern Ireland							
Belfast Lo.	886	1,162	1,141	1,771	1,318	(Mar)	1,256
Lo. Neagh/Beg	1,188	612	753	2,022	316	(Oct)	978
Upper Lo. Erne	306	137	195	231	164	(Feb)	207
Carlingford Lo.	216	259	279	140	101	(Jan)	199
Larne Lo.	179	88	128	92	110	(Sep)	119
Lo. Foyle	35	60	101	224	80	(Sep)	100
Strangford Lo.	49	67	60	71	95	(Sep)	68
Dundrum Bay	22	68	78	84	9	(Oct)	52

† data from Friends of Cardigan Bay, e.g. Green & Elliott (1993)

†† data from CCW

RED-NECKED GREBE*Podiceps grisegena***International importance:** 330**Great Britain importance:** 1*†**All-Ireland importance:** ?

*50 is normally used as a minimum qualifying level

GB maximum: 48 Aug**NI maximum:** 0**Trend****not available**

Since they were included in WeBS, the total count of Red-necked Grebes in Great Britain has usually numbered between 15 and 30. The count in August was therefore exceptional, both in size and date. Red-necked Grebes normally move to tidal waters to moult in August when they may congregate in flocks but are more normally found in ones or twos during the winter (Cramp & Simmons 1977). However, the nearest significant breeding populations are in Germany and Denmark, so the occurrence of these birds is puzzling. Counts on the Forth fell to more normal levels of 10 to 15 birds for the rest of the winter. No other sites in Great

Britain held five or more birds in 1993-94, although birds were recorded at 35 other sites, mainly in the Southeast, with many remaining for several months at the same sites. No birds were recorded in Northern Ireland.

Recent surveys of the Baltic Sea show this area to support a high proportion of the Northwest European wintering population, with over 5,500 birds (Durinck *et al.* 1994). Other significant concentrations have been found along the Norway coast, with 2-3,000, and in the Danish Wadden Sea, with 1,000 birds.

Table 13. RED-NECKED GREBE: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Great Britain†							
Forth Est.	-	-	32	22	44	(Aug)	33

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

SLAVONIAN GREBE*Podiceps auritus***International importance:** 50**Great Britain importance:** 4***All-Ireland importance:** ?

*50 is normally used as a minimum qualifying level

GB maximum: 115 Jan**NI maximum:** 4 Feb**Trend****not available**

Numbers in Great Britain again peaked at just over 100 birds in mid winter, although rather fewer than the count of 163 in 1992-93. Numbers at many of the key sites were about average or slightly lower. Counts at some sites have shown quite large fluctuations over the last three seasons, although the state of the sea will have had a significant influence on the quality of these counts. Nevertheless, a general pattern of larger numbers at more northerly sites appears to be emerging for the regularly used sites, Pagham Harbour being the notable exception. Other sites to hold four or more birds in 1993-94 were Studland Bay (8, March), North-west Solent (6, January), Chichester Harbour (5, January), Langstone Harbour (5, February), Loch of Swannay (4, November), Ryde Pier to Puckpool Point (4, December), Lindisfarne (4, December) and Guernsey Shore (4, February). In addition, a number of

sites in Speyside each held around half a dozen birds in July and August as birds dispersed from local breeding sites. Very few birds were recorded in Northern Ireland, presumably as a result of unfavourable counting conditions at key sites.

Slavonian Grebes wintering in Britain and Ireland comprise two different groups of birds (Cramp & Simmons 1977). Birds with larger bills breed in isolated populations in Iceland, Scotland and northern Norway and winter around Scottish and Irish coasts and southern Norway. Small-billed birds, breeding in Sweden and across the central CIS, winter in the southern North Sea, including southern England.

Table 14. SLAVONIAN GREBE: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Great Britain							
Moray Fth	-	-	†57	†60	†53	(Nov)	57
Pagham Hbr	-	-	7	57	14	(Mar)	26
Forth Est.	-	-	17	32	28	(Jan)	26
Lo. Indaal	-	-	36	19	22	(Nov)	26
Lo. of Harray	-	-	29	39	9	(Mar)	26
Lo. na Keal	-	-	24	-	-		24
Sound of Tarransay	-	-	-	12	-		12
Blackwater Est.	-	-	18	11	8	(Jan)	12
Poole Hbr	-	-	6	10	8	(Feb)	8
Exe Est.	-	-	7	4	11	(Jan)	7
Lo. Linnhe: Camas Shallachain	-	-	-	-	-		-
Northern Ireland							
Lo. Foyle	-	-	7	-	5	(Jan)	6
			8	51	0		20

† RSPB/BP studies (e.g. Stenning 1994)

BLACK-NECKED GREBE*Podiceps nigricollis*

International importance: 1,000

Great Britain importance: 1*†

All-Ireland importance: ?

*50 is normally used as a minimum qualifying level

GB maximum: 42 Nov

NI maximum: 0

Trend

not available

Numbers in 1993-94 were fractionally higher than the previous two seasons in Great Britain. Langstone holds by far the largest flock, with reasonable numbers recorded throughout the winter, whilst those at Studland also remained relatively high throughout the midwinter period. Together, these two sites support the bulk of UK

birds. Thirty four other sites, largely in southeast England but also in the West Midlands/Cheshire area, also held Black-necked Grebes, counts on the Medway (4, January) and the Wey/Fleet (4, January) being the largest. This species has yet to be recorded in Northern Ireland by WeBS.

Table 15. BLACK-NECKED GREBE: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Great Britain							
Langstone Hbr	-	-	20	28	26	(Nov)	25
Studland Bay	-	-	-	-	11	(Nov)	11

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

CORMORANT*Phalacrocorax carbo*

International importance: 1,200

Great Britain importance: 130

All-Ireland importance: ?†

GB maximum: 15,355 Feb

NI maximum: 1,301 Nov

Trend	89-90	90-91	91-92	92-93	93-94
GB	141	160	146	147	165
NI	269	194	158	223	198

Peak counts of Cormorant in 1993-94 in Great Britain rose by 10% on 1992-93 figures, topping 15,000 for the first time. This is borne out by index values which also reached their highest value in 1993-94. Numbers in Northern Ireland were conversely much lower than the previous winter, with only Belfast and Strangford Loughs holding above average numbers. Indices here,

however, tend to fluctuate to a greater degree. Monthly variations show that numbers peak in early winter then decline slowly in Great Britain and more rapidly in Northern Ireland (Tables 3 and 4).

Fifty-four sites currently record average peak counts of national importance, eight more than the previous

winter. The Inner Moray Firth, however, held the highest number at any individual site since the scheme first recorded Cormorants in 1986-87, with a phenomenal count of 1,500 birds in the Longman Bay area alone. This coincided with totals of over 7,500 Shags, 3,500 Guillemots and 5,000 Razorbills in the Inverness and Beauly Firths, presumably exploiting a large, temporary source of food at a time when feeding conditions in the North Sea were poor (Stenning 1994). Other sites in Britain had mixed fortunes and, surprisingly, given the rise in total numbers, peak counts at several of the top sites were well below average. In addition, the following sites also held greater than 130 Cormorants in 1993-94: Deeping St. James Gravel Pits (233, July), Staines Reservoir (226, October), Farmoor Reservoirs (183, December), Stodmarsh (160, December), Draycote Water (152, March), Rye Harbour/Pett Level (147, September), Dungeness Gravel Pits (145, January), Irvine Estuary (140, August) and the Burry Inlet (136, October).

Two races of Cormorant are present throughout the year in the UK. During the winter months, it is estimated that approximately 5-10% of the population belongs to the continental race, *P.c. sinensis* (Kirby *et al.* 1995b). Recent observations at Abberton Reservoir suggest that there may be some introgression between

the continental race and the commoner Atlantic race *P.c. carbo* in the UK, since hybridization has been observed (G. Ekins pers. comm.).

The Cormorant has probably received more press coverage in the UK over the last few years than most other bird species as a result of its continued increase in numbers, particularly at inland sites, and piscivorous habits. Similar trends have also been noted in other European countries (Van Eerden & Zijlstra 1991). Cormorants are commonly dubbed the 'black plague', 'dark destroyers' and even the 'black luftwaffe', with large-scale culls being demanded by some anglers and fishery managers. Unlicensed killing of Cormorants is common at some coastal Scottish fish farms (Carss 1994), and several thousand birds are probably killed annually throughout the British Isles. Despite this, the population continues to grow in many areas, and recent research (Callaghan *et al.* submitted) suggests that most stillwater fisheries can support the feeding activities of Cormorants without experiencing significant economic damage. The UK government has recently commissioned a considerable amount of new research into the interactions between piscivorous birds and fisheries, the results of which will be used to guide licensing policy.

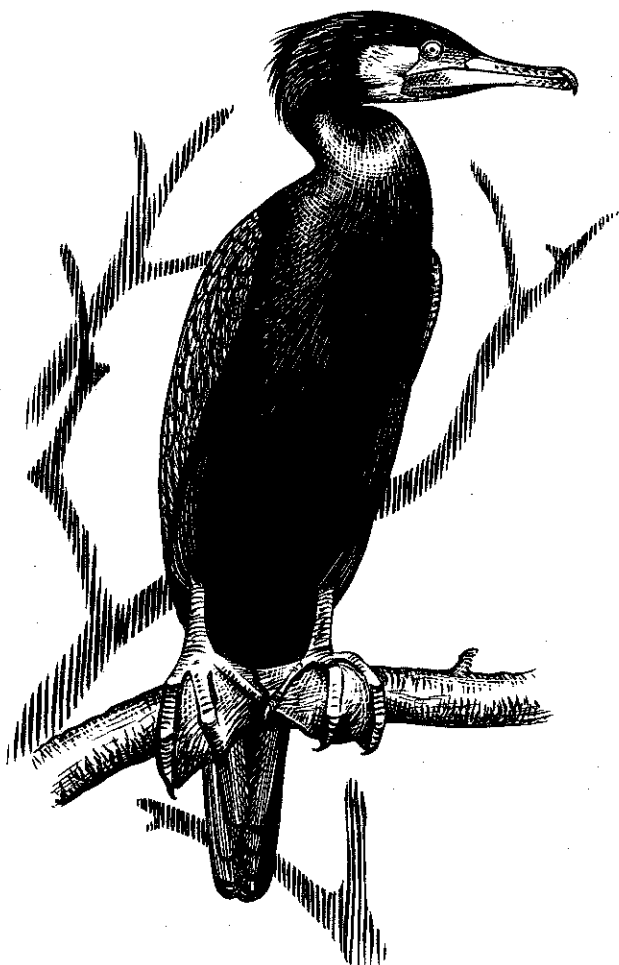


Table 16. CORMORANT: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Great Britain							
Morecambe Bay	1,497	991	1,113	802	895	(Oct)	1,060
Forth Est.	766	962	951	737	622	(Dec)	808
Solway Est.	600	492	606	757	682	(Aug)	627
Medway Est.	920	1,216	417	108	212	(Aug)	575
Inner Clyde Est.	663	408	810	565	377	(Oct)	565
Inner Moray Fth	354	109	117	167	1,945	(Feb)	538
Rutland Water	250	350	445	532	800	(Oct)	475
Lo. Leven	330	800	390	317	297	(Feb)	443
Colne Est.	409	169	286	384	676	(Feb)	385
Abberton Rsr	570	320	380	351	159	(Oct)	356
Poole Hbr	232	417	377	380	368	(Oct)	355
Grafham Water	74	450	350	270	470	(Feb)	323
Tees Est.	337	480	211	345	181	(Oct)	311
Queen Mary Rsr	315	467	226	124	407	(Oct)	308
Dee (Eng/Wal) Est.	291	286	201	313	431	(Sep)	304
Ranworth/Cockshoot Br.	325	329	327	271	259	(Jan)	302
Ouse Washes	533	163	182	248	335	(Mar)	296
Blackwater Est.	219	208	210	244	501	(Feb)	276
Alt Est.	334	502	252	143	455	(Nov)	271
Rostherne Mere	214	222	159	261	369	(Dec)	245
Wash	219	253	193	206	297	(Aug)	239
Hanningfield Rsr	100	374	156	258	240	(Nov)	226
Swale Est.	228	263	238	161	236	(Aug)	225
Irvine to Saltcoats	-	-	-	260	190	(Nov)	225
Carmarthen Bay	276	303	151	131	237	(Sep)	220
Queen Elizabeth II Rsr	138	320	430	70	98	(Sep)	211
Thames Est.	255	168	211	204	204	(Sep)	208
Lindisfarne	0	720	82	141	60	(Jan)	201
Barn Elms Rsr	160	147	260	118	247	(Mar)	186
William Girling Rsr	200	232	177	186	132	(Sep)	185
Ribble Est.	176	172	161	222	175	(Nov)	181
Dengie Flats	51	43	201	401	203	(Jan)	180
North Norfolk Marshes	83	122	174	87	††426	(Aug)	178
Pow Burn to Barassie	-	-	114	264	146	(Oct)	175
Stour Est.	162	124	175	145	250	(Oct)	171
NE Kent/Thanet	-	-	205	25	247	(Jan)	159
Chew Valley Lake	99	149	162	160	220	(Nov)	158
Southampton Water	171	171	145	175	120	(Nov)	156
Blythfield Rsr	135	209	144	102	-	-	148
Exe Est.	147	83	146	238	119	(Oct)	147
Moray Coast	155	114	161	84	205	(Oct)	144
Dysynni Est.	46	81	200	(9)	245	(Aug)	143
Tamar Est.	126	163	143	146	109	(Aug)	137
Breydon Water	180	141	126	122	113	(Aug)	136
Lo. of Strathbeg	128	110	155	175	95	(Jan/Feb)	133
Windermere	84	50	177	174	186	(Nov)	134
Northern Ireland							
Lo. Neagh/Beg	951	904	446	1,018	546	(Nov)	773
Belfast Lo.	369	284	343	380	483	(Sep)	372
Strangford Lo.	317	119	123	189	259	(Oct)	201
Upper Lo. Erne	316	192	194	111	109	(Feb)	184
Outer Ards	197	245	146	97	100	(Nov)	157
Carlingford Lo.	175	101	174	167	130	(Jan)	149
Lo. Foyle	136	147	188	120	130	(Aug)	144

† as no qualifying level has been set for national importance for Cormorant in Northern Ireland, a threshold 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

LITTLE EGRET
Egretta garzetta

International importance: 800[†]
Great Britain importance: ?[†]
All-Ireland importance: ?[†]

GB maximum: 190 Sep
NI maximum: 1 Oct/Nov/Feb

Trend not available

The peak British total of Little Egret was recorded in September when 190 birds were recorded and more than 100 birds were reported in all months except July. The only record in Northern Ireland was of one bird recorded in several months at Larne Lough. Those sites recording peak counts of nine or more birds are listed in Table 17. As expected all are on the extreme southern edge of Britain.

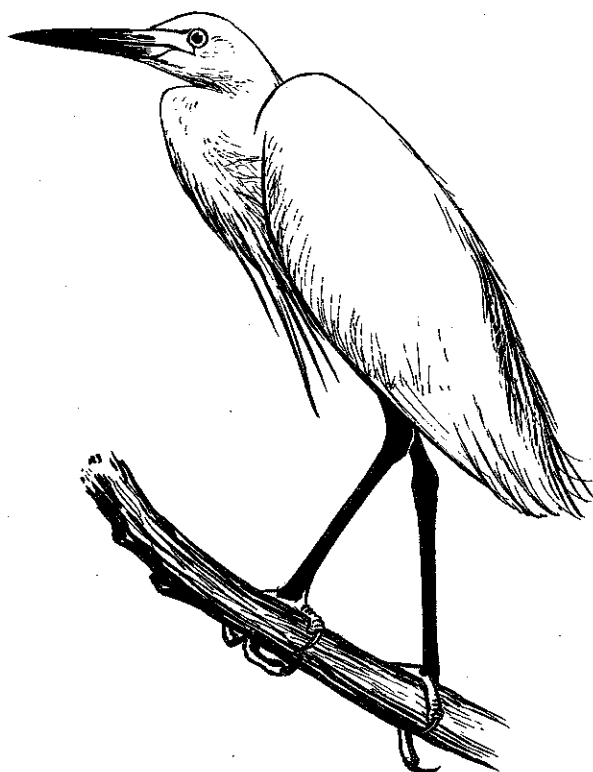
of young birds from France. The main influxes occur in July and August, with the bulk of the birds occurring in southern and southwest Britain. Roosting concentrations are now recorded regularly at several coastal sites in the early autumn, with up to 70 birds at one site in Cornwall (Gantlett *et al.* 1993). The numbers of birds using the roosts decline towards the end of the year, as they begin to wander to new areas.

The recent dramatic increase in Little Egrets recorded in Britain has been attributed to post-breeding dispersal

TABLE 17. LITTLE EGRET: MAXIMUM COUNTS JULY 93 - MARCH 94[†]

Tamar complex	48	(Sep)
Chichester Hbr	44	(Sep)
Kingsbridge Est.	27	(Nov)
Poole Est.	24	(Oct)
Fowey Est.	13	(Mar)
Teign Est.	12	(Aug)
Taw/Torridge Est.	11	(Aug/Sep)
Guernsey Coast*	10	(Oct)
Langstone Hbr	10	(Aug)
Hayle Est.	9	(Oct)
Erme Est.	9	(Oct/Nov)
NW Solent	9	(Oct)

[†] as no qualifying levels have been set for national importance for Little Egret, the ten sites with the greatest peak counts have been chosen for presentation in this report



GREY HERON
Ardea cinerea

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

GB maximum: 3,277 Oct
NI maximum: 353 Oct

Trend

not available

In the 1993-94 winter recorded totals of Grey Heron were similar to the previous year in both Britain and Northern Ireland. The peak national totals were again registered in autumn. Compared to 1992-93 two more sites recorded counts exceeding 50 birds. Those recording the greatest 1993-94 peaks are listed in Table 18. The main difference from the previous year is the appearance of Walthamstow Reservoir[#].

conditions caused birds of both species to nest on the same lake. Viable offspring were produced from a male Grey Heron/female Purple Heron pairing and from a male Purple Heron/female Grey Heron (Fenyvesi 1992). Presence of nests of Grey Heron at a new mixed colony in the central Po plain, Lombardy, confirms the expansion of this species in this area (Brichetti & Barbieri 1992).

In Hungary, there have been two cases of hybridisation with Purple Heron *Ardea purpurea* where drought

TABLE 18. GREY HERON: MAXIMUM COUNTS JULY 93 - MARCH 94

Loughs Neagh & Beg [#]	167	(Oct)
Walthamstow Rsr [#]	100	(Feb/Mar)
Deeping St James Mere [#]	100	(Jul)
Somerset Levels [#]	94	(Oct)
Tamar complex	91	(Oct)
Dee Est. (England/Wales)	86	(Oct)
Strangford Lo.	73	(Nov)
Tees Est.	71	(Jul)
Taw/Torridge Est.	64	(Aug)
Wash	63	(Aug/Sep)

† as no qualifying levels have been set for national importance for Grey Heron, the ten sites with the greatest peak counts have been chosen for presentation in this report

MUTE SWAN
Cygnus olor

International importance: 1,800
Great Britain importance: 260
All-Ireland importance: 55

GB maximum: 14,949 Nov
NI maximum: 1,768 Jan

Trend	89-90	90-91	91-92	92-93	93-94
GB	145	162	150	151	161
NI	119	116	117	116	107

In Britain, winter 1993-94 saw an 8% increase in peak numbers of Mute Swan compared with the previous year. As most birds in Britain and Ireland are largely resident, this suggests a reasonably successful breeding season in 1993. Indices support this, while the long term trend suggests that the population has stabilised in recent years following increases in the late 1980s. This population change corresponded with the campaign against, and subsequent banning of, the use of lead weight in fishing during the mid 1980s which greatly reduced the incidence of lead poisoning, previously the major cause of Mute Swan mortality in England (Sears & Hunt 1991). Other factors such as the increase in available habitat through the creation of flooded gravel workings and a succession of mild winters may also have had a positive influence. Peak totals and indices in Northern Ireland have been very stable in the last five

seasons, but dropped slightly in 1993-94, perhaps as a result of poor weather conditions in the spring and summer months which may have depressed breeding success.

The Fleet/Wey recorded the highest count in the UK in 1993-94, as numbers at Loughs Neagh & Beg fell sharply from the high counts in recent years. Average counts at these sites still remain well below the level of international importance and it seems unlikely that any UK site will maintain such numbers regularly unless the current population grows substantially. Notable counts were made at the Ouse Washes and the Tweed Estuary, numbers greatly exceeding the sites' five year means. Rutland Water was elevated to national importance for the first time in 1993-94, although the Mid Avon Valley only appears newly in the table as a result of having

been inadvertently omitted from last year's report. Loch of Harray recorded comparatively low numbers for the second consecutive year, and the peak of 71 at Christchurch Harbour was remarkably low for a site that has regularly held in excess of 300 birds. Two other sites in Great Britain recorded peak counts of 260 birds or more: Nene Washes (356, January) and Loch Leven (298, August). No other sites in Northern Ireland held nationally important numbers in 1993-94.

The rapid rise and subsequent decline of the Loch of Harray Mute Swan population was well monitored (Meek 1993). Following the growth and spread of non-native Canadian Pondweed *Elodea canadensis*, the number of breeding pairs in the Harray/Stenness system rose from 36 in 1983 to 115 in 1990, with swans unusually adopting a semi-colonial approach to nesting in order to benefit from the abundant food source. Winter numbers also rose dramatically, peaking at over 1,200 in 1990-91, as did the numbers of other grazing species, notably Whooper Swan and Wigeon. Throughout 1991 there was a marked mortality of Mute Swans, involving some 250 predominantly first year birds. Wintering numbers dropped sharply the following season and by 1992 the breeding population was reduced to just 13 pairs. The *Elodea* had undergone a distinct decline by the spring of 1991, and examination of Mute Swan corpses showed that the birds were emaciated, anaemic and suffering from severe parasite infestation. The exact causes of the pondweed's rapid expansion and decline are unknown, and it remains to be seen whether it maintains a more stable level or undergoes continuing fluctuations.

Increases in the number of birds on the River Wylfe, Wiltshire, have been accompanied by complaints from farmers of loss of grass through grazing and trampling, and unpalatability due to droppings (Trump *et al.* 1994), damage more normally associated with geese. Research has shown that birds in the area strongly favour improved or reseeded grassland over poorer pastures and crops whilst studies of the population dynamics showed that numbers of breeding and moulting birds are swelled by immigrants to give a peak in winter and spring. Management aimed at reducing numbers of waterfowl is often undertaken during moult when birds are flightless and easy to round up. However, since the peak numbers had left the valley at this time, suggested management options have focused on scaring birds from fields at times when grass is particularly vulnerable to damage, combined with the provision of alternative food sources for the swans. A further suggestion is the growing of crops not favoured by the swans; planting of linseed oil in the valley has seen a reduction in numbers in some areas. However, the effectiveness of such practices, and scaring techniques in particular, has yet to be tested.

Until the mid 1980s, most of the Mute Swans using the Slimbridge WWT Centre, Gloucestershire, moulted at Frampton gravel pits just a few kilometres to the north. However, since then, the majority of birds have switched to Slimbridge during the July and August period (Ryley & Bowler 1994). Observations in late summer 1991 showed that birds spent around 42% of their time feeding, 19% loafing, 18% performing comfort activities such as preening and 15% in movement, either swimming, flying or walking. Birds at Slimbridge fed mostly on provided grain or grazed, whilst birds at Frampton fed on submerged vegetation. Until the mid 1980s, birds were discouraged from using Slimbridge as they competed for food with the captive birds. When this was relaxed, it is thought that the predator free environment and the regular supply of food at Slimbridge caused birds to switch sites. A safer environment at Slimbridge allowed a significantly higher proportion of birds to spend more time in comfort movements and social interactions than those at Frampton which spent more time moving, presumably due to disturbance and the need to find food as the supply in an particular area was depleted.

Table 19. MUTE SWAN: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Great Britain							
Fleet/Wey	891	1,029	1,173	1,126	1,196	(Sep)	1,083
Lo. of Harray	683	1,205	564	261	275	(Aug)	598
Ouse Washes	544	414	365	615	923	(Dec)	572
Abberton Rsr	599	635	562	487	572	(Aug)	571
Tweed Est.	360	368	370	640	720	(Aug)	492
Avon Valley (Mid)	311	448	446	398	327	(Mar)	386
Somerset Levels	332	256	252	525	467	(Jan)	366
Lo. of Skene	175	275	329	375	404	(Nov)	312
Lo. Bee	254	307	-	-	-		281
Colne Est.	316	255	278	325	183	(Oct)	271
Christchurch Hbr	538	150	352	210	71	(Oct)	264
Rutland Water	205	246	299	211	342	(Sep)	261
Northern Ireland							
Lo. Neagh/Beg	1,465	1,205	1,601	1,746	1,115	(Oct)	1,426
Upper Lo. Erne	430	470	520	355	413	(Jan)	438
Strangford Lo.	174	195	114	118	213	(Sep)	163
Broad Water Canal	-	89	128	(6)	175	(Oct)	131
Lo. Foyle	168	118	102	95	80	(Feb)	113
Dundrum Bay	101	113	79	100	145	(Dec)	108
Corbet Lo.	-	105	100	36	-		80
Belfast Lo.	93	61	31	59	91	(Jan)	67
Drumgay Lo.	-	-	-	26	106	(Dec)	66

BLACK SWAN

Cygnus atratus

Introduced

GB maximum: 14 Jan/Feb
 NI maximum: 0

A native of Australia, Black Swans were found at 23 widely scattered sites throughout Great Britain. Many birds remained at the same sites for several months, if not throughout the winter. The vast majority of records

were of single birds, although five were at Thorpe Water Park all winter, and two were found at both Bourton-on-the-Water Gravel Pits in August and September and at Morecambe Bay in February.

TRUMPETER SWAN

Cygnus buccinator

Introduced

GB maximum: 3 Feb
 NI maximum: 0

This species is the nearctic equivalent of the Whooper Swan. Once widespread throughout North America, it was hunted to what was thought to be the edge of extinction in the 1930s. It has since recovered following protection and reintroduction schemes, whilst the

discovery of a large population in Alaska also provides a brighter outlook (Madge & Burn 1988). In the UK, birds were recorded only at Tansor Gravel Pits, where three of a larger group of escaped birds have survived and been present for a number of years.

BEWICK'S SWAN*Cygnus columbianus bewickii***International importance: 170****Great Britain importance: 70****All-Ireland importance: 25***

*50 is normally used as a minimum qualifying level

GB maximum: 6,494 Jan
NI maximum: 343 Dec

Trend	89-90	90-91	91-92	92-93	93-94
GB	253	279	296	205	185
NI	172	189	93	45	77

The number of Bewick's Swans in Britain was not only 29% lower than the highest count yet recorded by WeBS (9,118 in 1991-92), but also lower than all other peaks in the last five seasons, which have ranged from 7,016 to 8,444. There was a similar picture in Northern Ireland where, although counts were slightly higher than in 1992-93, numbers remain well below peak counts of the early 1990s. Indices confirm both sets of findings. Monthly fluctuations, based on numbers from sites counted in all months from September to March, show that the peak in Great Britain occurred in December (Table 3). More normally, the peak occurs in January or February, perhaps suggesting that the onward movement of birds from the continent into Britain did not occur in 1993-94, accounting for the low total. As in previous seasons, birds departed rapidly after the February count with only a small number remaining into March.

Age counts of birds using the WWT centres indicated another poor breeding season in 1993, with around 7-10% young recorded at Welney and Martin Mere (Bowler *et al.* 1994). However, 14.4% of the 368 individuals identified at Slimbridge during the winter were juveniles, suggesting a bias in the distribution of family parties throughout the wintering grounds.

Numbers on the Ouse Washes, the principal site for this species, were well below the five year average, although they were higher on the adjacent Nene Washes. Counts at the remaining sites of international importance were generally close to their respective five year averages with the exception of Martin Mere/Ribble Estuary, Loughs Neagh & Beg, the Avon Valley (Mid) and Lough Foyle. At Martin Mere,

competition from increasing numbers of Whooper Swans is believed to be forcing birds away from the site and numbers have declined steadily since 1990-91. There has been a similar pattern of decline in numbers since peaks in 1990-91 at both Loughs Neagh & Beg and the Avon Valley (Mid). The peak count on the Avon Valley (Lower) was also well below the five year average, thereby discounting the possibility that the swans had simply moved down the valley. At Lough Foyle, the five year average is strongly influenced by the record high count in 1989-90 and indeed the peak count in 1993-94 was up on the previous winter. An especially large count for Strangford Lough meant that the site's five year average exceeded the all-Ireland qualifying criterion, despite a peak of only one bird in the previous four winters. Around half the birds remained at the site for the rest of the winter, although future seasons will show whether this site has been chosen as a traditional wintering haunt. Durleigh Reservoir (133, February) was the only other site in the UK to support numbers exceeding the national qualifying level in 1993-94.

The collaborative study of Bewick's Swans breeding in the Nenetski State Game Reserve in northeast European Russia, involving British, Russian, Dutch and Danish scientists, entered its third successive summer in 1993. Observations were made of the breeding ecology of the swans from late May until August. Snow-melt was slow in the spring which meant that nesting was a week later than in 1992. In addition, the number of nests in the study area and the size of the clutches (mean clutch size 3.1) were lower than in the previous two seasons. A total of 83 swans were caught and marked at the Khabuicka study site by the team (Bowler *et al.* 1994).

Table 20. BEWICK'S SWAN: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
International							
Ouse Washes	5,984	5,100	5,542	5,169	4,172	(Dec)	5,193
Nene Washes	270	653	1,189	2,543	1,922	(Jan)	1,315
Martin Mere/Ribble Est.	660	†1,046	†848	†764	†582	(Jan)	780
Breydon Water	528	167	394	268	331	(Jan)	338
Severn Est.	†339	†362	†322	†329	†313	(Jan)	333
Walland Marsh	††280	††240	††300	††315	††288	(Jan)	285
Lo. Neagh/Beg	303	523	232	163	115	(Jan)	267
St Benet's Levels	266	182	294	173	179	(Feb)	219
Somerset Levels	222	141	170	209	195	(Feb)	187
Avon Valley (Mid)	146	296	213	128	90	(Jan)	175
Lo. Foyle	412	195	106	59	92	(Nov)	173

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Great Britain							
Walmore Common	137	164	†97	†163	127	(Dec)	138
Wash	101	62	72	117	111	(Jan)	93
Pulborough Levels	78	114	110	66	66	(Feb)	87
Avon Valley (Lower)	121	75	61	129	35	(Nov)	84
Woodsford Water Meadows	-	-	-	79	(0)		79
Northern Ireland							
Canary Road	-	-	135	-	59	(Dec)	97
R. Lagan; Moira	111	-	11	41	84	(Dec)	62
Boghill Fields	54	-	104	31	26	(Dec)	54
Strangford Lo.	1	1	0	0	133	(Oct)	27

† from WWT annual swan reports (e.g. Bowler *et al.* 1994)

†† D. Walker (in litt.)

WHOOPEE SWAN***Cygnus cygnus*****International importance:** 170**Great Britain importance:** 55**All-Ireland importance:** 100**GB maximum:** 3,259 Nov**NI maximum:** 1,981 Jan**Trend** 89-90 90-91 91-92 92-93 93-94**GB** 258 273 188 186 158**NI** 79 90 81 85 74

Indices for both Great Britain and Northern Ireland show a continued decline in numbers since 1990-91. Total counts, however, did not reflect this trend as clearly. Counts in Great Britain, whilst much lower than 1990-91 figures, were on a par with the last two seasons. Those in Northern Ireland were much lower than 1992-93, but were similar to the two seasons before that. Monthly fluctuations showed that birds arrived earlier than normal in Northern Ireland, a large proportion of the total present in October (Table 4). Numbers then fell slightly before recovering to give a midwinter peak. Breeding success was again higher than for Bewick's Swans, with 11-17% juveniles at WWT reserves (Bowler *et al.* 1994), representing a slight improvement on the 9-14% recorded in the previous season.

A total of 29 sites support nationally important numbers of Whooper Swans. Of the 11 internationally important sites, only three, the Ouse Washes, Martin Mere/Ribble Estuary and the Loch of Strathbeg, held numbers above their respective five year averages. The flock at the Ouse Washes continues to grow; indeed, it held the largest count at any site in 1993-94. The increasing use made of both the Ouse Washes and Martin Mere/Ribble Estuary may well be at the expense of other sites. Counts at Lough Foyle fluctuate considerably between years and peak numbers often occur early in the winter prior to the birds dispersing south and east. There is a high degree of interchange, however, between this flock and those on Lough Swilly just over the border in County Donegal, both within and between winters, which may account for the widely fluctuating annual peak counts. At the remaining 18 nationally important sites, numbers were generally average or below average. The count on the Dornoch Firth in January was unusually high and contrasts with other sites in the area where numbers were especially low,

notably Loch Eye/Cromarty Firth and the Inner Moray Firth. Numbers in the Cromarty area normally show a short-lived peak in early winter as birds pass through. In recent winters, it appears that birds linger for too brief a period for large numbers to build up. Other sites in Britain supporting 55 or more Whooper Swans in 1993-94 were the River Tweed: Rutherford (102, November), East Fortune Ponds (96, January), Saintear Loch (76, November), the Wash (76, February), Drumore Loch (56, November), Bemersyde Moss (56, February) and Loch of Clumly (55, December). No other sites held 100 or more birds in Northern Ireland.

A new project investigating the mechanics and aerodynamics of flight in swans was initiated in 1993. Transmitters will be attached to selected adult Whooper Swans in Iceland and their movements tracked by satellite until the arrival of the birds in the wintering range. Two swans were caught during their annual wing-moult in late July 1994. Both were ringed birds which winter regularly at Caerlaverock so that the transmitters can be retrieved during the 1994-95 winter (Bowler *et al.* 1994).

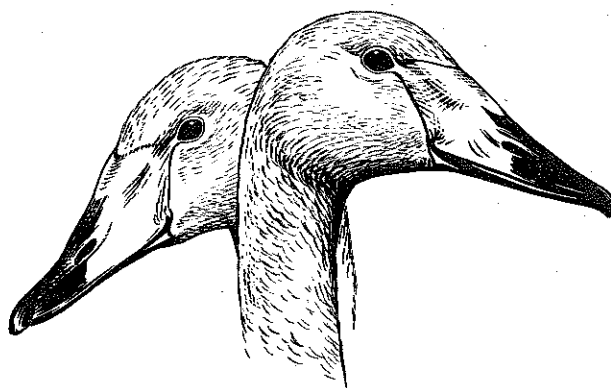


Table 21. WHOOPER SWAN: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94 (Mth)	Average
International						
Lo. Neagh/Beg	1,088	1,110	1,182	883	1,083 (Jan)	1,069
Ouse Washes	686	578	††778	††856	††986 (Feb)	777
Upper Lo. Erne	726	896	889	612	721 (Feb)	769
Lo. Foyle	519	988	596	1,166	569(Oct/Nov)	768
Lo. Eye/Cromarty Fth	†1,695	†1,115	†340	†389	72 (Oct)	721
Martin Mere/Ribble Est.	572	538	††631	††666	††650 (Feb)	611
Lo. of Harray	817	927	32	19	51 (Dec)	369
Lo. of Skene	406	314	340	425	243 (Oct)	346
Black Cart Water	-	-	-	-	262 (Nov)	262
R. Foyle: Grange	-	-	211	-	297 (Mar)	254
Solway Est.	277	††192	190	††200	††175 (Feb)	207
Lo. of Strathbeg	264	129	176	140	302 (Nov)	202
Lo. of Spiggie	257	-	165	141	-	188
Great Britain						
Lo. Leven	220	180	90	127	99 (Nov)	143
R. Tweed: J. Pool-Coldstream	135	131	51	139	137 (Dec)	119
Inner Moray Fth	234	87	97	†155	19 (Dec)	118
Cargen Water: Islesteps	107	76	96	71	74 (Dec)	85
Wigtown Bay	57	103	80	105	75 (Dec)	84
Lindisfarne	102	82	70	50	94 (Jan)	80
Lo. of Sabiston	172	53	57	23	77 (Nov)	76
R. Teviot: Kalemouth-Roxburgh	-	-	65	80	-	73
Fairburn Ings	81	103	73	67	38 (Dec/Jan)	72
R. Teviot: Nisbet-Kalemouth	-	-	66	82	58 (Jan)	69
Merryton Ponds	46	44	78	63	72 (Feb)	61
Milldam & Ballfour Mains Pools	-	-	66	58	60 (Dec)	61
Glaslyn Marshes	-	-	-	64	53 (Dec)	60
Dinnet Lo.	152	75	35	31	3 (Feb)	59
Easterloch Uyeasound	65	-	56	57	-	59
Dornoch Fth	55	56	38	17	120 (Jan)	57

† R.J. Evans in litt.

†† from WWT annual swan reports (e.g. Bowler et al. 1994)

SWAN GOOSE*Anser cygnoides*

Introduced

GB maximum: 19 Oct

NI maximum: 0

This species was formerly widespread, breeding in Russia, Mongolia and China but a number of pressures, including hydroelectric dams and hunting, have seen a large reduction in numbers, and the native population was recently estimated to number less than 50,000

(Green 1992). Escaped or introduced birds were recorded at just six sites in Great Britain, often remaining throughout the winter, with the largest concentrations being eight at Etherow Country Park and five on Tresco Great Pool.

BEAN GOOSE*Anser fabalis*

International importance: 800

Great Britain importance: 4*

All-Ireland importance: +*

*50 is normally used as a minimum qualifying level

GB maximum: 424 Jan

NI maximum: 0

Trend not available

Given that Bean Geese spend a high proportion of their time in non-wetland areas, a surprisingly large proportion of the estimated UK total was counted by WeBS in 1993-94. Just over 500 birds currently winter in

the UK, compared with 400-500 in the 1950s and just 100-200 in the 1970s (Cramp & Simmons 1977), suggesting that numbers in Great Britain have remained reasonably stable over the last 40-50 years.

Nearly all British birds are to be found in two flocks: in the Yare Valley area of Norfolk and in the Carron Valley area of Central Region, although numbers at the former site were rather lower in 1993-94 than in recent seasons. The midwinter count at Heigham Holmes, though only short-lived, was exceptional and considerably higher than the small numbers regularly recorded there. Although viewing conditions at the site are difficult, it is thought that these birds may differ from those in the Yare Valley; only time will tell if the site will become a regular haunt for this species. Quite large groupings occurred away from these locations, with the following sites holding 10 more birds in 1993-94: Ouse Washes (25, February), Deben Estuary (22, December), Bough Beech Reservoir (12, December), Tophill Low Reservoirs (10, January) and Burshill Ponds (10, January). It is not clear whether these relate to wandering birds from the two main flocks or additional immigrants from the continent, although a number of the latter undoubtedly occur in some years, as in Spring 1992-93. Escapes and feral birds further confuse the picture, with 32 being found during the survey of introduced geese in 1991 (Delany 1992).

The Bean Geese in the Carron Valley area were recently the subject of an RSPB study (Smith *et al.* 1994). More accurately referred to as the Slamannan plateau birds, this flock uses fields and small lochs in the Fannyside area, and their regular occurrence was only confirmed in the early 1980s. Fieldwork in 1993-94 found the birds' distribution focused around two areas on the plateau. However, birds were mobile and unpredictable in their use of fields, which varied on a daily and monthly basis, as well as between years. Birds were found to favour intensive or semi-intensive pasture furthest from roads and buildings. Of these, fields subject to a higher degree of seasonal flooding and without livestock were used most often. Unlike the Norfolk flock, the Slamannan birds were observed feeding at night and with a different distribution to that noted during the day. The key conservation implication of these findings is that birds may use any fields of suitable quality and recommendations to avoid detrimental impact through forest planting in the area are provided in the report.

Table 22. BEAN GOOSE: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Great Britain							
Middle Yare Valley	†344	†485	†405	350	305	(Dec)	378
Heigham Holmes	-	-	-	24	365	(Jan)	195
Carron Valley	††116	††147	††146	††126	†††135	(Nov)	134

† data from M. Parslow-Otsu

†† data from J. Simpson

††† Smith *et al.* 1994

PINK-FOOTED GOOSE

Anser brachyrhynchus

International importance: 1,900
Great Britain importance: 1,900
All-Ireland importance: +*

GB maximum: +224,354 Oct
NI maximum: 1 Oct

Trend	89-90	90-91	91-92	92-93	93-94
GB	254	266	324	275	312

The 1993 breeding season was relatively good for Pinkfeet with averages of 18.1% young and 2.18 young per pair present in autumn flocks (Mitchell 1994). The number counted in the October census was 225,000. This is believed to be a close estimate of the true population due to good coverage and co-ordination, and good counting conditions. The count represents a 13% increase compared with 1992, although it is still slightly lower than the highest ever count of 232,962 in 1991-92.

Over 50% of the October total was found at just five sites: Montrose Basin, where the count was a new record for the site, Loch of Strathbeg, Aberlady Bay, West Water Reservoir and Hule Moss. Even so, larger counts at individual sites are often made on other dates as

observers undertake many roost counts, normally in early and mid October, in an attempt to record the short-lived peak that occurs just after birds arrive in the country and migrate to more southerly midwinter sites. Thus, the count of over 40,000 at West Water had fallen to only 20,200 on the census date just a week later. Other sites, such as Cameron Reservoir, recorded their winter maximum as birds returned north during spring. The distribution of geese at this time may differ from autumn due to changed food availability and also because disturbance from shooting, which has finished by late winter, may make some sites untenable in autumn.

Through a combination of ringing studies and counts, it has long been known that a large number of Pinkfeet

move south to Lancashire and Norfolk as the winter progresses, returning in spring via the Solway and later the Moray (e.g. Fox *et al.* 1994a). It is suggested that this strategy accounts for the success of Pinkfeet, allowing birds to exploit different agricultural landscapes at the most appropriate times, in particular, following the 'spring-bite' of newly grown grass north in spring. Although WeBS counts have traditionally provided some counts of Pink-footed and Greylag Geese throughout the winter to indicate these broad scale movements, the only accurate means of recording the importance of many sites is by undertaking roost counts. To this end, WWT organised special roost counts at major sites in January and late March (Stenhouse & Mitchell 1994), in addition to the normal census in October and November. By midwinter, the major autumn gatherings had clearly broken up and the geese had dispersed widely throughout their range. Despite poor counting conditions, especially in January, the numbers counted in mid winter were 160,812 (72% of the autumn population estimate) and 83,320 (37%) in March (Stenhouse 1994). In January, only 12 sites held over 1,900 Pinkfeet. Four of these held over 10,000 birds, including all three roosts in Norfolk which alone supported a total of 68,560 Pinkfeet, representing 43% of the total counted in January and 30% of the total population estimate. This was a new record for the county, where co-ordinated counts in recent seasons

have produced peak totals of around 35-40,000 birds. The count at Snettisham, on the Wash, was both a new maximum for the site and the largest at any site in 1993-94. In March 1994, only three sites held over 10,000 Pinkfeet, the Ythan Estuary being the key site with 23,880 birds. Such information will be vital in ensuring the effective conservation of such a mobile population (Fox *et al.* 1994a).

The makeup of the top five sites for Pinkfeet remains as in the previous report, although the use of Loch of Strathbeg has overtaken that of West Water Reservoir. Numbers in southwestern Lancashire were noticeably fewer than normal, perhaps as a result of birds quickly moving on to Norfolk and accounting for the record count in the latter area. Counts at only three other sites, Hule Moss, Fala Flow and Loch Mahaick, were obviously lower than their respective averages, all having shown a consistent decline in recent years. Conversely, those at Holkham, Cameron Reservoir and Aberlady Bay all beat previous maxima by a considerable margin. High counts at West Water Reservoir and on the Ythan Estuary showed a return to form for these sites whilst the record number at Montrose Basin continues the steady rise, the peak mean now exceeding 25,000. Cobbinshaw Reservoir (+3,000, October), Dinnet Lochs (2,435, April) and Eden Estuary (+2,360, November) were the only other sites to support more than 1,900 birds in 1993-94.

Table 23. PINK-FOOTED GOOSE: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
International							
Dupplin Lo.	+31,000	+42,000	+57,500	+25,500	+36,500	(Oct)	38,500
SW Lancashire	+37,550	+31,805	+38,240	+32,800	+25,185	(Jan)	33,116
Lo. of Strathbeg	+32,150	+37,100	+23,350	+30,650	38,970	(Nov)	32,444
West Water Rsr	36,250	+24,700	+32,636	+25,000	+40,000	(Oct)	31,717
Montrose Basin	12,000	15,000	+25,000	+35,000	+41,210	(Oct)	25,642
Snettisham	19,168	††21,350	††17,160	††24,400	+45,925	(Jan)	25,600
Lo. Leven	+18,000	16,000	21,880	23,070	+18,800	(Oct)	19,550
Hule Moss	+25,735	+16,755	+18,500	15,880	14,100	(Oct)	18,194
Slains Lo./Ythan Est.	+30,300	+13,190	-	+4,360	+23,880	(Mar)	17,933
Scot Head	11,500	††19,250	††19,600	††15,200	16,860	(Dec)	16,482
Solway Est.	17,178	17,271	9,330	12,388	+17,470	(Feb)	14,727
Holkham	-	††7,100	††14,300	††9,150	††27,760	(Jan)	14,578
Cameron Rsr	+9,500	3,820	+12,270	15,477	27,300	(Mar)	13,673
Aberlady Bay	+5,600	17,500	+9,995	+7,000	+26,000	(Oct)	13,219
Castle Lo., Lochmaben	(259)	16,380	14,000	+3,000	(300)	(Mar)	11,127
Fala Flow	11,920	9,908	+16,410	+4,800	+6,450	(Oct)	9,898
Carsebreck/Rhynd Lo.	11,200	+9,900	+9,250	8,000	+7,120	(Oct)	9,094
Fylde/Morecambe Bay	9,150	+8,240	+9,000	6,100	+6,100	(Jan)	7,718
Lo. of Kinnordy	8,240	6,980	+6,120	+4,630	9,195	(Nov)	7,033
Cowgill Rsr	(1,500)	+3,700	+2,800	+6,700	5,400	(Nov)	4,650
Wigtown Bay	6,007	6,776	3,810	3,009	3,530	(Mar)	4,626
Lo. Tullybelton	+3,000	+5,500	+4,500	+5,800	4,100	(Nov)	4,580
Glenfarg Rsr	-	+3,990	+320	+4,800	+3,800	(Oct)	3,228
Gladhouse Rsr	5,400	3,200	+2,700	+2,300	2,500	(Nov)	3,220
Drummond Pond	(0)	+3,550	3,450	3,000	2,550	(Oct)	3,138
Crombie Lo.	1,391	1,000	+4,250	3,500	3,000	(Jan)	2,628
Lake of Menteith	1,885	+3,600	1,725	(80)	3,000	(Oct)	2,553

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Lo. Mahaick	5,250	4,515	1,471	+800	+600	(Nov)	2,527
Skinflats	-	-	+2,155	+2,596	+2,051	(Nov)	2,267
Lo. Eye/Cromarty Fth	+1,194	+5,500	1,527	800	+1,662	(Mar)	2,137
Hightae Lo.	1,665	(0)	2,430	400	+4,000	(Mar)	2,124
Lo. Mullion	-	-	+1,475	+2,550	+2,195	(Oct)	2,073
R. Forth: Gargunnock	-	-	-	-	+2,060	(Mar)	2,060
Dun's Dish	+2,800	+2,200	+620	+2,270	+2,400	(Oct)	2,058
Upper Forth Est.	-	-	-	-	+2,001	(Mar)	2,001
Biggar Water	-	-	-	-	2,000	(Mar)	2,000

† from Lancashire Goose Report (e.g. Forshaw 1994)

†† Paul Fisher (in litt.)

EUROPEAN WHITE-FRONTED GOOSE

Anser albifrons albifrons

International importance: 4,500

Great Britain importance: 60

All-Ireland importance: +*

GB maximum: 5,289 Feb

NI maximum: 0

Trend

not available

Numbers of European Whitefronts in Britain can fluctuate quite considerably from one year to the next, probably due, to a large extent, to the severity of the winter on the continent causing birds to seek out the milder, western parts of their range. Aided by a good breeding season, with 28% young and an average brood size of 2.8, the national total showed returned to more normal levels after a low count in 1992-93. Accordingly, counts at the two key sites, Slimbridge WWT on the Severn and the Swale Estuary, returned to levels consistent with their respective five year averages. Most of the other key sites also held numbers equal to or higher than their long term average. Although this does not appear to be the case at Breydon Water and Heigham Holmes, both sites benefited from the large influx in spring 1993 and it is unlikely that their 1992-93 numbers will be recorded on a regular basis. However, the declines in the Mid and Lower Avon Valley, which together regularly held over 500 birds in the mid 1980s and 1,500 in 1980-81, are of more concern. The fall in the number of Bewick's Swans at this site in 1993-94 also points to the possibility of a common factor influencing these birds and merits close observation. Increases were noted at Dungeness, where, although sporadic, sizeable numbers were recorded for the second time in three winters, and at North Warren, where the increase no doubt relates to the management regime in operation now that the area is an RSPB reserve. It will be a few more years before it is clear if the latter site is established as a regular haunt. There were a large number of wandering birds in mid winter, mainly in East Anglia or Southeast England, with the Ouse Washes (106, January), Nene Washes (71, February), Minsmere (69, January) and Pegwell Bay (67, January) all supporting more than 60 birds.

as a Ramsar site, have shown a considerable increase from 10,000 to 140,000 over the last 30 years (Mooij 1993). Bean Geese have increased from 1,000 to 20-30,000 over the same time. This increase is not thought to relate to a general increase in the population, as studies on the breeding grounds have shown numbers to be stable during this period, but to a general westwards shift of the wintering distribution. These increases have been observed throughout the wintering grounds in western Europe, including the Netherlands and Belgium, but with the exception of Britain. Although hunting was banned in many areas in the Rhine, this is not thought to have influenced the increase in numbers to any great extent. Birds were found to prefer fields subject to periodic flooding and with a 'structured' landscape that included trees and hedgerows, favoured more by Beans than Whitefronts. Mooij also found that geese favoured feeding sites within 10 km of the roost site and that towns and power lines acted as physical barriers to the birds, which would fly around, rather than over, these areas. Mooij advocates an integrated management plan that includes the establishment of a network of feeding sites with buffer zones of 300 m to prevent disturbance. He also suggests that the selective planting of hedgerows in these areas, and the planting of crops vulnerable to goose damage away from these sites, would benefit geese and farmers alike.

Numbers of Whitefronts wintering in the Lower Rhine area of Germany, much of which has been designated

Table 24. EUROPEAN WHITE-FRONTED GOOSE: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Great Britain							
Severn Est.	3,200	2,600	5,100	1,401	3,000	(Feb)	3,060
Swale Est.	1,660	2,280	1,500	900	1,652	(Jan)	1,442
North Norfolk Marshes	264	215	163	567	316	(Jan)	305
Heigham Holmes	-	-	-	350	163	(Feb)	257
Buckenham Marshes	-	295	165	238	+265	(Jan)	241
Breydon Water	35	75	50	539	80	(Nov)	156
Thames Est.	157	85	178	122	103	(Jan)	129
Avon Valley (Mid)	64	108	221	84	0		95
Avon Valley (Lower)	68	105	172	54	20	(Dec)	84
Dungeness GP	0	2	168	11	174	(Jan)	71
North Warren/Thorpeness Mere	-	-	1	66	120	(Feb)	62

GREENLAND WHITE-FRONTED GOOSE***Anser albifrons flavirostris***

International importance: 260

Great Britain importance: 140

All-Ireland importance: 140

GB maximum: +17,771 Nov

NI maximum: 143 Nov

Trend	89-90	90-91	91-92	92-93	93-94
GB	120	126	135	127	142
NI	98	103	105	95	75

The Greenland White-fronted Goose Study (GWGS) undertook its twelfth annual census of this sub-species throughout Britain in 1993-94. The totals of 17,711 in the autumn census and 15,769 in spring (Fox 1994a) show a considerable increase on recent seasons, continuing the steady growth since protection in the early 1980s. Combined with counts made throughout the island of Ireland, co-ordinated by the Irish National Parks and Wildlife Service (NPWS), the total population is estimated to number some 30,300 birds, around average for the last five seasons. Breeding success was above average, with 18.7% young, whilst brood size was average, with 3.4 young per pair.

All regularly used sites except Jura were covered by the census. The bulk of the total are counted outside the WeBS network, although WeBS counts at several sites make a valuable contribution to the growing database maintained by GWGS. Numbers at sites have shown mixed fortunes in recent years. Islay's importance continues to increase steadily, although marking studies have shown that this represents more than just a single site for the geese, with many, largely distinct, flocks using the island (Fox *et al.* 1994b). Numbers on Tiree were apparently low for the second winter in succession, whilst those at Loch Lomond fell further in 1993-94. Counts at Danna & Keills have shown a consistent, albeit modest, increase in each of the last five winters.

To mark the twelfth co-ordinated count, the NPWS and GWGS published an international summary of results and developments since the early 1980s (Fox *et al.* 1994b). The report provides a clear and succinct record of the monitoring, research and conservation developments over the period, with comprehensive

accounts for all wintering sites in Ireland and Britain, staging sites in Iceland and breeding areas in Greenland.

Despite the consistent growth since the early 1980s, following the banning of hunting in Ireland and Scotland and voluntary cessation on the Dyfi, there is still cause for concern. Unlike most other European geese, Greenland Whitefronts are very widely dispersed in many small flocks, often involving only a few tens of birds. The rise in overall numbers is largely attributable to increases at major sites, notably Islay. Numbers in the rest of Scotland and Ireland have shown more modest increases, whilst those in Northern Ireland have declined over the period. This represents a restriction in range, partly as a result of the loss of favoured habitats, typically the bogs in the Celtic fringe of the British Isles. Given the extreme site loyalty shown by the birds, protection of the small sites is vital if the range and distribution of the geese is to be maintained, as required under international legislation. Also highlighted in the report is the need for protection in Iceland. Although only legally shot during the autumn, poaching does occur widely in spring and the geese benefit greatly from the sympathetic approach adopted on one experimental farm that maintains traditional crops favoured by the birds. Protection was afforded in Greenland in 1985 and since then, five major Ramsar sites that include large areas of goose summering grounds have been designated.

The considerable co-operation between the countries that support the Greenland Whitefront population resulted in the agreement of the Wexford Declaration by participants at an international workshop in 1992.

However, the lack of any progress since then towards signing a proposed Memorandum of Agreement by the respective governments, or towards implementing a international conservation plan already drafted

(Stroud 1992), is disappointing. It is important that urgent government progress is made in order to consolidate on the recent improvement in conservation status.

Table 25. GREENLAND WHITE-FRONTED GOOSE: MAXIMA AT MAIN RESORTS⁺

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
International							
Islay	8,826	8,857	10,676	11,004	11,679	(Nov)	10,208
Machrihanish	1,005	1,240	1,023	1,110	1,103	(Mar)	1,096
Rhuna/haorine	914	797	1,499	726	1,050	(Mar)	997
Tiree	987	941	1,101	418	499	(Mar)	789
Coll	671	792	621	438	896	(Mar)	684
Stranraer Lo.	770	600	438	550	565	(Mar)	585
Lo. Ken	550	306	382	323	325	(Nov)	377
Lo. Lomond: Endrick Mouth	300	350	350	250	137	(Dec)	277
Danna/Keills	224	245	287	288	308	(Mar)	270
Great Britain							
Appin/Eriska/Benderloch [†]	120	314	270	112	323	(Mar)	228
Westfield Marshes	209	180	329	190	196	(Oct)	221
Lo. Heilen/Lo. Mey	305	160	148	160	180	(Dec)	191
Colonsay/Oronsay	120	250	210	195	150	(Dec)	185
Bute	30	160	250	130	213	(Nov)	157
Dyfi Est.	131	152	143	134	160	(Oct)	144
Linne Mhuirich/Lo. na Cille [†]	-	-	-	284	0		142

+ largely based on data from GWGS reports (e.g. Fox 1994a)

† probably significant numbers of the same birds moving between these sites

LESSER WHITE-FRONTED GOOSE

Anser erythropus

Scarce and Introduced

GB maximum: 3 Mar
NI maximum: 0

The provenance of Lesser White-fronted Geese in Britain is highly questionable, to the extent that the British Birds Rarities Committee, who preside over the authenticity of records of scarce species in Britain, has decided for the time-being simply to document all records of this species and separate vagrants from escapes once clear patterns have become established

(Rogers *et al.* 1993). Given large numbers of escaped birds known to be at large, those seen in 1993-94 at Stodmarsh (3, March), on the Duddon Estuary (1, January) and on the Wey/Fleet (1, January) are more likely to be of feral origin than to have made the journey from the continent.

GREYLAG GOOSE

Anser anser

Icelandic Population

International importance: 1,000

Great Britain importance: 1,000

All-Ireland importance: 40*

*50 is normally used as a minimum qualifying level

GB maximum: +99,253 Nov
NI maximum: 805 Jan

Trend	89-90	90-91	91-92	92-93	93-94
GB	129	177	136	152	153

The 1993 breeding season was relatively good for Greylags with averages of 18.9% young and 2.35 young per pair present in autumn flocks (Mitchell 1994). The November census recorded around 100,000 birds, slightly more than

the previous season. Current indices show numbers to be roughly stable, though with slight fluctuations. Although the mean index value for the most recent five years is almost identical to that for the previous five year period,

the population is noticeably smaller than in the late 1980s, when counts exceeded 100,000 for four winters in succession.

Early arrivals were markedly concentrated, with counts of 14,000 or more at both Loch of Skene and Loch Eye accounting for a large proportion of the birds present in October. There were also marked concentrations at the time of the November census, with Dinnet Lochs and Loch of Skene alone holding over 25% of the total, and Lower Bogrotten, Caithness Lochs, Loch Spynie and Udale Bay all supporting more than 5,000 birds. Overall, 23 sites accounted for 79% of the population. Nevertheless, a further 71 sites held between one and 1,000 birds, demonstrating the dispersed nature of this species compared to Pinkfeet.

Owing to rapid turnover in some areas, observations on dates other than those chosen for the national census often record the winter maxima at individual sites. Counts of 27,173, 25,396 and 19,190 were made at Dinnet Lochs in November yet on the census date (17 November) only 11,502 were counted there. Just 8,000 birds remained at Loch Eye in early November but, following fireworks displays in the area, less than 300 birds could be located the following weekend and only 3,965 were recorded on the November census date. It is thought that the unprecedented count at Udale Bay relates to birds having moved from the Loch Eye area and illustrates their susceptibility to disturbance.

Special counts were organised in January and late March as part of a study undertaken by WWT to look at the distribution of Greylags outwith the normal autumn census period (Stenhouse & Mitchell 1994). Midwinter counts returned a total of 41,654 birds (42% of the autumn population estimate), despite poor counting conditions, whilst March counts found 34,031 (35%) (Stenhouse 1994).

Hebridean Population

The population of indigenous Greylags breeding on the Uists is currently being monitored through separate counts. February 1994 produced a post-hunting population of 2,500 (WWT unpubl. data), similar to the value obtained

In January, 14 sites held over 1,000 birds, yet only three of these held over 3,000 (Dinnet Lochs, Loch of Skene and Drummond Pond). In March, only seven sites held over 1,000 Greylags with Haddo Park supporting 4,300.

Twelve sites, in addition to those in Table 26, held in excess of 1,000 birds in 1993-94: Carlhurle Bay (+2,470, February), Loch of the Lowes (+2,220, November), Eden Valley (+2,150, February), Eden Estuary (+2,020, November), Kilconquhar Loch (+1,844, November), Solway Estuary (1,549, March), Whitton Loch (+1,500, November), Loch Fleet (+1,500, November), Marlee Loch (+1,200, October), River Teviot: Nisbet to Kalemouth (1,090, February), Long Loch (+1,000, November) and Loch na Bo (+1,000, January).

Some Icelandic Greylag wander as far as Ireland to winter, and the most recent complete census found around 3,800 birds, mainly in the Republic (Merne 1986). However, this number is known to include some 700 feral birds (Prater 1993), notably at Strangford Lough and Lough Erne. It is thus difficult to be confident about the origin of the birds in Table 26, although it appears that a large proportion of the WeBS counts in Northern Ireland probably relates to resident birds.

Efforts by the Highland Ringing Group to catch and ring Icelandic wintering Greylags in the 1990s, mainly in the Loch Eye area, have met with considerable success. Colour-ring sightings of individuals have helped our understanding of within-winter movements and reveal the mobile nature of some of the Greylags passing through the Moray Firth in autumn. Most resightings or recoveries were made quite locally until midwinter, when several birds were recorded in Dumfries & Galloway, Tayside and even Orkney (Stenhouse & Mitchell 1994). By spring, birds showed a marked concentration in the Moray area, although several birds lingered in southwest Scotland, including Arran and Bute.

International importance: 50
Great Britain importance: 50

in 1992-93. Although this represents only around half the estimated population size, the survey did not include parts of mainland Scotland or the more southerly Hebridean islands where the remainder of the population occurs.

Feral Population

GB maximum: 15,666 Jan

Numbers of other non-migratory Greylag in Great Britain, which derive mainly from feral and translocated birds, have been estimated in this report by summing counts from all counties in England and Wales, with the exception of Northumberland, and adding 2,340 (after Delany 1992) for feral birds in Scotland. The January peak represents over 80% of the total counted during the

Introduced

Trend not available

1991 WWT survey of introduced geese (Delany 1992), when birds were concentrated in central and eastern England, especially East Anglia, and the northwest, notably Cumbria. In 1993-94, counts at Bolton-on-Swale Gravel Pits (1,266, February) and Tophill Low Reservoirs (668, November) were the only records of over 500 birds from this population.

Table 26. GREYLAG GOOSE (ICELANDIC POPULATION): MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
International							
Dinnet Lo./R. Dee	15,800	16,000	+18,400	+21,650	+27,173	(Nov)	19,804
Lo. Eye/Cromarty Fth	+11,193	+18,593	+4,659	+16,842	+14,842	(Oct)	13,226
Lo. of Skene	13,305	19,150	5,298	14,100	+14,000	(Oct)	13,171
Inner Moray Fth	9,271	+8,525	+7,000	+4,900	+6,300	(Dec)	7,199
Lo. Spynie	3,350	+6,100	+6,600	+7,280	5,000	(Nov)	5,666
Tay/Isla Valley	+2,959	+6,262	+5,072	+7,414	+3,877	(Nov)	5,117
Haddo House Lo.	+4,700	+5,900	+6,000	4,200	4,600	(Mar)	5,080
Caithness Lo.	+2,958	+3,064	+4,216	+6,800	+5,443	(Nov)	4,494
Orkney	1,817	5,179	4,637	+4,533	+4,774	(Mar)	4,188
Lo. of Lintrathen	2,490	+3,600	+3,950	3,900	4,100	(Oct)	3,608
Drummond Pond	+1,800	+3,600	+1,840	+5,050	4,000	(Oct)	3,258
Lower Bogrotten	-	+1,450	+1,200	+3,000	+5,620	(Nov)	2,818
Stranraer Lo.	+2,400	+2,140	+3,300	3,600	2,500	(Nov)	2,788
Bute	3,200	+4,200	1,725	2,100	+1,500	(Nov)	2,545
Lo. of Strathbeg	+7,050	925	900	+850	1,600	(Dec)	2,265
Holburn Moss	3,200	+740	2,750	+2,500	1,500	(Feb)	2,138
Fedderate Rsr	+2,700	+2,950	+250	-	-		1,967
Lindisfarne	+1,700	2,000	2,450	+690	+2,000	(Jan)	1,768
Ballo Rsr	-	-	+1,420	3,000	133	(Oct)	1,518
Corby Lo.	2,600	1,150	1,400	1,100	1,080	(Nov)	1,466
Hoselaw Lo.	3,200	+1,270	+1,750	+450	+472	(Nov)	1,428
Dornoch Fth	2,407	1,407	927	+1,560	+692	(Mar)	1,399
Udale Bay	-	+252	+206	+105	+5,000	(Nov)	1,391
Lo. Garten	-	-	+1,280	+1,057	+1,550	(Nov)	1,296
R. Spey: Boat of Balliefirth	-	-	-	-	1,115	(Nov)	1,115
Carsebreck/Rhynd Lo.	2,150	880	+765	+910	685	(Jan)	1,078
Gadloch	1,300	+809	807	+1,292	850	(Nov)	1,012
Northern Ireland							
Strangford Lo.	276	546	348	522	461	(Mar)	431
Lo. Foyle	204	452	134	90	48	(Nov)	186
Temple Water	60	163	162	151	250	(Jan)	157
Lo. Neagh/Beg	146	206	214	7	70	(Nov)	129
Larne Lo.	27	72	71	34	21	(Mar)	45
Upper Lo. Erne	13	45	-	0	117	(Jan)	44

BAR-HEADED GOOSE*Anser indicus***Introduced**

GB maximum: 15 Dec

NI maximum: 0

Bar-headed Geese breed in the mountainous regions of southern and central Asia, wintering in the floodplains of the Indian subcontinent to the south. Naturalised birds in the UK were recorded at 22 sites, mainly in the southeast, southwest and north Wales, although birds were quite transitory compared with other feral geese recorded by

WeBS and were often only seen in one month at any given site. Counts at Colemans Reservoir (12, December) and Theale Gravel Pits (7, February) were notable, whilst two birds toured Anglesey during the course of the winter, being seen at Alaw Reservoir in September, Llyn Maelog in October and Llyn Traffwll in January.

SNOW GOOSE*Anser caerulescens***Introduced**

GB maximum: 78 Sep
 NI maximum: 0

The total count in Britain usually numbered 60 to 80 birds during 1993-94. The majority of this total is accounted for by two flocks, one at Blenheim Park Lake, with up to 30 birds in October, and another flock that moves between Eversley Cross & Yateley Gravel Pits and Stratfield Saye, with peaks of 34 in January at the

former, and 33 in March at the latter. North Norfolk Marshes (24, August) was the only other site to hold 20 or more birds. Although genuine vagrancy from North America has and probably still does occur from time to time, distinguishing these birds from the large, feral population in the UK is a frustrating if not impossible task.

ROSS'S GOOSE*Anser rossii***Introduced**

GB maximum: 17 Jan
 NI maximum: 0

This species has a limited breeding range in arctic Canada, wintering in western and southern United States. In the UK, birds were found at just three sites in 1993-94 where they were resident throughout mid

winter. Esthwaite Water held a maximum of 16 in November whilst singles were recorded at Kings Bromley Gravel Pit and Stowe Pool, Lichfield.

EMPEROR GOOSE*Anser canagicus***Introduced**

GB maximum: 1 Dec
 NI maximum: 0

In its native range, this is a largely maritime species, favouring the coastal tundra of Alaska and also Russia in the breeding season and rocky shores and islands, especially the Aleutians, in the winter (Madge & Burn 1988). In 1991, 21 birds were found during the survey of

introduced geese in Britain, mainly in Northwest England and North Wales (Delany 1992). Just one bird was recorded by WeBS in 1993-94, on the River Trent near Shardlow.

CANADA GOOSE*Branta canadensis***Introduced†**

GB maximum: 35,028 Jan
 NI maximum: 583 Jan

Trend	89-90	90-91	91-92	92-93	93-94
GB	307	371	401	365	375

The Canada Goose is the most abundant and well known of the non-native waterfowl in the UK. The peak in Great Britain of just over 35,000 birds was marginally lower than in previous seasons, when maxima of between 37,000 and 42,000 have been recorded. Index values also suggest that the population has remained relatively stable over the past four winters. It is worth noting that the numbers recorded by WeBS are significantly lower than those recorded by the survey of

introduced geese in 1991, when more than 63,000 birds were recorded (Delany 1995), largely due to the better coverage and the fact that the survey was made during the moulting period. Extrapolation from tetrad surveys used during the most recent breeding atlas produced a similar figure to Delany (Carter 1993). However, it does appear that the steady growth of the population between 1953 and 1991, at a rate of 6.8% to 8.0% per year (Delany 1992), has slowed considerably. Numbers in

Northern Ireland, although small, vary quite considerably from month to month and have increased steadily in recent years, from a peak of just 252 in 1990-91, to almost 600 in 1993-94, the first time that the total count has exceeded 500. Given the problems encountered at sites with large numbers of birds in Great Britain, this increase is potentially worrying, although birds are fairly localised in Northern Ireland, with the breeding range restricted principally to the Lough Erne complex (Carter 1993).

The assessment of trends at individual sites must be viewed with some caution, given that control regimes operating at some sites will have undoubtedly influenced numbers. Numbers at Kedleston returned to levels recorded in the early 1990s, double that of recent seasons, whilst the Lower Derwent Valley and Rutland Water were the only other major sites to hold significantly more birds than their five year mean. Six other sites recorded peak counts of 600 or more Canada Geese: Pitsford Reservoir (709, August), Eyebrook Reservoir (677, September), Great Linford Gravel Pits (609, January), Dinton Pastures

(608, September), Thames Estuary (608, January) and Port Meadow (600, January).

Canada Geese remain a considerable nuisance in some areas, causing damage to crops and amenity grasslands, posing potential health hazards in park lands through the fouling of paths, increasing competition for food with native wildfowl and adding to the nutrient load in enclosed water bodies (Allan *et al.* submitted). Various control measures have been carried out across the country, including shooting, scaring, egg pricking and even chemical repellents to discourage feeding. The success of these measures is difficult to assess since they have often been individual responses to local problems rather than experiments with controlled monitoring. Successful control at a local level is likely to require an integrated approach, employing several techniques tailored according to the biology and behaviour of the local population. Research is underway into the population dynamics of Canada Geese, their interactions with native waterfowl, and the pathogens found in their droppings.

Table 27. CANADA GOOSE: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Great Britain†							
Stratfield Saye	1,350	1,701	2,350	1,090	705	(Nov)	1,439
Abberton Rsr	1,240	618	398	1,251	975	(Aug)	896
Kedleston Park Lake	1,080	1,060	570	520	1,100	(Oct)	866
Rutland Water	483	740	1,118	889	1,025	(Sep)	851
Dorchester GP	447	767	860	1,075	901	(Dec)	810
Blithfield Rsr	560	896	930	890	484	(Sep)	752
Bewl Water	1,000	546	660	943	420	(Dec)	714
Alde Est.	466	538	1,053	932	532	(Oct)	704
Lackford GP	-	-	1,000	380	-		690
Kingsbury WP/Coton Pools	503	598	504	869	666	(Dec)	628
Lower Derwent Valley	205	700	250	1000	919	(Jan)	615

† as Canada Goose is an introduced species in the UK, site designation does not occur and the 1% criterion is not applied. A threshold of 600 has been used as the basis for selecting sites for presentation in this report

BARNACLE GOOSE

Branta leucopsis

Greenland Population

International importance:	320
Great Britain importance:	270
All-Ireland importance:	75

GB maximum: +30,255 Mar
NI maximum: 94 Oct

Trend not available

The Greenland population had a moderately good breeding season in 1993, with 11.5% young. This follows two summers with the worst breeding success on record (2.6% and 4.6% young), but was apparently not sufficient to allow any substantial increase in the population. A flock of 83 birds in Strangford Lough from autumn to mid winter, the only substantial record away from key sites, almost certainly relates to birds from this population.

Despite the apparently stable numbers in recent seasons, the longer-term trend for the population as a whole is still upwards. Complete censuses of the whole Greenland population are scheduled every five years. The census in March 1993, which combined ground-based counts on Islay with aerial surveys of the west coast of Ireland and, in Scotland, the Outer and Inner Hebrides and Orkneys, could not be completed due to

bad weather in western Scotland. A repeat effort in March 1994 was successful and found a total population of 38,388, representing an 11% increase over the total in the previous survey 1988 (Delany & Ogilvie 1994, Merne & Walsh 1994). The survey also highlighted the continuing shift in the distribution of the population. Although the proportion of the population wintering in Ireland was more or less unchanged at 21%, geese wintering in Scotland have become more concentrated on Islay at the expense of more outlying islands. In 1988, 59% and 19% of the population wintered on Islay and outlying islands respectively, while in 1994 the figures were 67% and 8%. This increasing concentration of geese is also reflected in a decline in the number of sites holding internationally important numbers from 10 in 1988 to just six in 1994. The shift is apparently related to both the decline in livestock rearing on outlying islands,

leading to a decline in the suitability of pasture for geese, and the increasing and successful management of pasture specifically for geese on Islay (Self *et al.* 1994). Impressive though it may be to see large concentrations of geese, this is in some ways a worrying trend. Firstly, it makes the population more vulnerable to geographically concentrated mortality events, and secondly, it brings the geese into increasing conflict with farmers where these concentrations occur. On Islay, several schemes aimed at resolving the conflict have been tried with variable success, the current scheme involving payment of compensation according to the numbers of geese recorded grazing. Despite this, the shooting of Barnacle Geese under licence in order to scare them from vulnerable areas is now a major source of mortality. Six per cent of the total Islay population were shot in 1993-94.

Table 28. BARNACLE GOOSE (GREENLAND POPULATION): MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
International							
Islay	+25,297	+30,200	+25,947	+26,776	+25,452	(Nov)	26,734
Coll	+343	+275	+670	+3,093	+764	(Mar)	1,029
Tiree	+581	+1,012	+1,535	+984	+684	(Nov)	959
Colonsay	+450	+470	+600	+475	+500	(Nov)	499
Danna/Keills	+350	+375	+400	+270	450	(Feb)	306

† data extracted from the Argyll Bird Report

Svalbard Population

International importance: 120
Great Britain importance: 120

GB maximum: 13,700 Oct

Trend not available

The Svalbard population, wintering exclusively on the Solway Firth, had 11.7% young in autumn flocks in 1993. Although a considerable increase on the previous year's figure (5%), this is somewhat below the long term average. Nevertheless, the number of geese present on the Solway showed a marked increase over 1992-93, reaching the highest ever total of 13,700 and continuing the long term increase of the last 40 years that has resulted largely from successful international conservation action.

This population was recently the subject of a modelling exercise (Pettifor & Rowcliffe 1995) in which computer programs were used to predict the likely effect of changes in productivity and mortality on the total number of birds. Modelling indicated that older, established breeding colonies are now showing a decrease in breeding success

as a result of over-crowding, and we might therefore expect the rate of population increase to begin slowing. It is also clear, however, that new colonies are still being established, and these now account for most of the production of young. The capacity for further population increase thus depends on how much space remains on Svalbard for the establishment of new colonies, something that is presently poorly known. The main conclusion of the population modelling work is that the Svalbard population remains highly vulnerable in the long term to unpredictable changes of fortune, and is particularly sensitive to changes in mortality. Despite the low numbers, the strong concentration of the population on the Solway is, as on Islay, bringing the geese into increasing conflict with agriculture, and increasing shooting mortality may therefore become a problem.

Table 29. BARNACLE GOOSE (SVALBARD POPULATION): MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
International							
Solway Est.	+11,700	+12,100	+12,700	+12,200	+13,700	(Oct)	12,480

Feral Population

In addition to the truly wild birds occurring in the UK, naturalised populations have also become established in the UK, largely as a result of escapes from collections.

Introduced

The WWT survey of introduced geese in 1991 found just over 800 birds widely scattered, mostly in small flocks throughout England (Delany 1992).

DARK-BELLIED BRENT GOOSE

Branta bernicla bernicla

International importance:	2,500
Great Britain importance:	1,000
All-Ireland importance:	+

GB maximum:	125,069	Jan
NI maximum:	0	

Trend	89-90	90-91	91-92	92-93	93-94
GB	283	381	467	312	399

The peak count of Dark-bellied Brent Geese in the last five years has varied quite considerably, with up to 138,000 in 1991-92. Counts in 1993-94 were slightly better than average for recent winters, and were considerably higher than the low in 1992-93 that followed a breeding failure the previous summer. Total numbers vary largely as a result of breeding success, which fluctuates dramatically from year to year. In poor years, fewer than 5% young are found on the winter grounds, and usually the figure is less than 1%. In good years, the proportion of young is often 25% or more. The proportion of juveniles observed in autumn 1993 was 18% (Mitchell & King 1994) which, although indicating a good year, was the lowest proportion of young in a good year in the last 10 winters. This was the third good year in the last four, and the fourth in the last six; only in one of the five seasons prior to this (1983 to 1987) was there good breeding success. This is reflected in the size of both the world population and numbers in Britain, which remained largely stable during the mid 1980s but started to rise again in the late 1980s (e.g. Mitchell *et al.* 1994). Counts in October recorded a lower proportion of young than those in November as non-breeding birds and failed breeders tend to arrive a little earlier than successful birds and their young. The average brood size was 2.7 birds.

The peak count of Brents in Great Britain occurs in mid winter as birds shift from Holland and the Wadden Sea area. Although numbers in Britain have generally continued to rise since comprehensive monitoring began in the mid 1960s, the rate of increase has not matched that of the world population. Consequently, the proportion of the population using Britain as fallen, from 50-65% in the late 1960s and 1970s to 35-50% during the last seven winters (Mitchell & Cranswick 1994). It might be expected that the reverse would be true, since,

if birds spill over to Britain once continental areas have reached their carrying capacity, Britain would have to accommodate all of the increase in each season. It appears that the management regimes that have been developed for geese on the continent in recent years allow the area to accommodate a larger number of birds, whilst the lack of hard winters in recent years, which push birds further west in search of milder weather, will also have allowed more birds to remain in the Wadden Sea area.

The importance of Great Britain for Dark-bellied Brents is illustrated by the fact that 16 sites are of international importance. Following a marked increase at the Fleet/Way in recent years, this site is the most recent addition to this number. Counts at the top five sites in particular have continued to grow steadily, each regularly holding in excess of 10,000 birds. Roughly equal numbers of sites held either above or below average numbers in 1993-94. However, there was no obvious geographical pattern to these changes, indicating that birds frequently shift between adjacent sites. No other sites held numbers exceeding national importance.

On a visit to the eastern Taimyr peninsular, Russia, in 1991, Summers *et al.* (1994) established that nesting Brent Geese belonged to the sub-species *B. b. bernicla*, with ringed birds later being seen in the Netherlands and Essex. A previous study in the 1950s had suggested that Brents in this part of the Taimyr belonged to the race *nigricans* that winters in North America. However, due to uncertainties about the methodology of in the earlier study, it is not absolutely clear whether or not *bernicla* has expanded its range since then, although the more than tenfold increase in the *bernicla* population over this period lends weight to this theory.

The work in 1991, followed up by further study in 1992 (Underhill *et al.* 1993), also sought to shed light on the debate over the relationship between the abundance of lemmings and breeding success in Brent Geese and waders. The 'Roselaar-Summers' hypothesis suggests that, in good lemming years, predators (mainly Arctic Foxes) feed almost exclusively on lemmings. In the following year, when predator numbers are high but lemming numbers are low, predators switch to taking birds' eggs and chicks. In this part of the Taimyr, 1991 was a good lemming year, followed by a marked decline in numbers in 1992. Observations of breeding success in Brent Geese and waders provided hard evidence to support the link between the cyclic fluctuations in lemming numbers and similar changes in the birds' breeding success. Fewer Arctic Foxes bred in the poor lemming year and, to compound the effects of prey switching, many became non-territorial, ranging over larger areas to exploit nests.

The researchers also found that 'abrition', whereby an aggressive species offers indirect protection from a predator to other species unable to defend themselves against the predator, influenced breeding success in Brent Geese. In 1991, all 14 Brent Geese nests located in the study area were in two 'colonies', clustered within 400 m of two Snowy Owl nests. This strategy provides protection from Arctic Foxes as, in good lemming years, the owl vigorously defends an area up to 500 m around its nest, thereby excluding foxes. Abrition thus further enhances breeding success, and in 1991 all goose nests hatched successfully. In poor lemming years, owls breed only in small numbers, if at all, and defend their nests less well so that foxes are able to predate nests more easily. Only one pair of geese attempted to breed in the area in 1992 and the only egg laid disappeared after one day.

Table 30. DARK-BELLIED BRENT GOOSE: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
International							
Wash	18,934	20,743	27,518	19,146	24,446	(Dec)	22,157
Thames Est.	12,555	33,109	17,211	15,691	18,733	(Oct)	19,460
North Norfolk Marshes	6,711	11,888	11,128	9,318	15,061	(Jan)	10,821
Chichester Hbr	9,484	9,406	11,582	11,099	12,647	(Jan)	10,749
Blackwater Est.	6,370	9,918	11,445	12,500	12,208	(Jan)	10,503
Langstone Hbr	7,821	6,133	7,860	7,056	7,776	(Jan)	7,329
Colne Est.	3,966	4,924	6,705	6,453	4,920	(Feb)	5,934
Hamford Water	(150)	6,889	4,008	3,677	8,154	(Feb)	5,682
Crouch/Roach Est.	3,109	8,388	7,978	3,159	4,913	(Jan)	5,509
Medway Est.	2,466	5,547	4,484	3,822	5,104	(Feb)	4,285
NW Solent	1,600	3,335	4,868	3,334	2,650	(Dec)	3,221
Pagham Hbr	2,755	3,181	3,669	2,969	2,638	(Feb)	3,042
Portsmouth Hbr	2,567	2,659	3,580	2,557	3,583	(Dec)	2,989
Fleet/Wey	850	2,800	4,355	1,982	3,983	(Nov)	2,794
Swale Est.	1,769	4,823	2,101	1,959	1,843	(Jan)	2,737
Humber Est.	1,631	2,733	3,773	2,615	1,795	(Jan)	2,509
Great Britain							
Deben Est.	2,000	-	3,000	1,555	3,282	(Jan)	2,459
Dengie Flats	1,900	1,950	2,350	2,320	2,780	(Jan)	2,260
Exe Est.	2,510	2,665	2,020	1,815	1,495	(Jan)	2,101
Southampton Water	1,457	1,340	2,752	2,314	2,420	(Jan)	2,057
Stour Est.	1,387	1,322	1,980	1,849	1,742	(Jan)	1,656
Newtown Est.	1,117	1,125	1,213	1,664	1,708	(Jan)	1,365
Poole Hbr	433	1,389	1,711	1,278	1,486	(Feb)	1,259
Beaulieu Est.	740	750	1,110	1,548	1,272	(Feb)	1,084

LIGHT-BELLIED BRENT GOOSE

Branta bernicla hrota

Canada/Greenland Population

International importance: 200

All-Ireland importance: 200

NI maximum: 14,979 Oct

Trend	89-90	90-91	91-92	92-93	93-94
NI	98	118	121	87	78

Mirroring the pattern observed in the population of Dark-bellied Brents, the peak count of Light-bellied Brent Geese, following a relatively good breeding

season with 20.0% young (David Andrews *in litt.*), showed a marked increase on the low numbers in the previous season. The peak total in 1993-94 was similar

to the levels recorded during the early 1990s. However, although peak numbers appeared normal, those in other months were depressed with, for example, only 3,000 and 6,000 in September and November, respectively (Table 2), months when counts normally exceed 10,000. As a result, the indices show a continued fall since the early 1990s. A decline in the eel grass *Zostera sp.* at Strangford Lough in recent years may encourage early dispersal and may account for numbers falling more quickly after October. Birds would deplete the smaller food supply more quickly and consequently move on to sites in the Republic earlier. The smaller numbers in September are presumably just a result of late arrival in 1993-94, although the same pattern was also seen in 1992-93. Although data from the

Republic of Ireland may allay fears regarding any decline the population as a whole, any continuation of this pattern in future years would give cause for concern regarding numbers in Northern Ireland.

Most sites continue to hold numbers considerably below those recorded three and four winters ago, although numbers at Strangford recovered strongly after 1992-93. One notable exception is Larne Lough, where a general increase combined with a large count in 1993-94 saw the site gain national importance. No other site held in excess of 200 birds, although wandering birds in Anglesey almost certainly relate to the Canadian and Greenlandic population. Inland Sea held 23 birds in February, whilst 20 were recorded at Foryd Bay in November.

Table 31. LIGHT-BELLIED BRENT GOOSE (CANADA/GREENLAND POPULATION): MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
International							
Strangford Lo.	12,423	13,237	10,359	8,367	12,795	(Oct)	11,849
Lo. Foyle	4,105	6,007	5,395	1,765	1,934	(Oct)	3,841
Carlingford Lo.	259	200	267	243	596	(Dec)	313
Outer Ards	150	418	238	132	181	(Feb)	224
Dundrum Bay	110	183	407	165	196	(Dec)	212
Larne Lo.	117	177	227	201	290	(Feb)	202

Svalbard Population

International importance: 40*

Great Britain importance: 25*

*50 is normally used as a minimum qualifying level

GB maximum: +2,160 Dec

Trend

not available

Following two seasons of relatively low counts, numbers of birds in Britain, which winter exclusively on Lindisfarne, were about average for the last five seasons, this figure representing around 50% of the world population. Although the number in Britain is largely dependent on the proportion that decide to vacate the other main wintering sites in Denmark, the increase in 1993-94 will have also been influenced by a good breeding season, with 31.4% juveniles (S. Percival *in litt.*).

Weekly counts at Lindisfarne showed that, after the arrival of a group of around 800 birds in mid September, there were regular influxes of small groups of birds, usually between 50 and 200, in nearly every week until the peak in December. This lasted for only around four weeks before birds departed, again in a rather piecemeal fashion. This pattern of migration is in marked contrast to the small population of Svalbard Barnacle Geese which tend to arrive *en masse* over just a few days.

Table 32. LIGHT-BELLIED BRENT GOOSE (SVALBARD POPULATION): MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
International							
Lindisfarne	3,000	2,700	1,440	1,865	+2,160	(Dec)	2,233

RED-BREASTED GOOSE

Branta rufficollis

Scarce and Introduced

GB maximum: 1 Oct/Nov/Apr

NI maximum: 0

As with Lesser Whitefronts, distinguishing feral and escaped birds from the truly wild Red-breasted Geese of Russia and eastern Europe, which are known to

occur in Britain on a regular basis, is often problematic to say the least. The best bet of genuine vagrancy is a bird associating with a large flock of another species

known to originate from roughly the same breeding or wintering area, although this is by no means a guarantee. Two such birds were found in 1993-94, one at

Caerlaverock on the Solway in October and November and another on the Beaulieu Estuary in April.

EGYPTIAN GOOSE

Introduced†

Alopochen aegyptiacus

GB maximum: 179 Aug

NI maximum: 0

The peak count in Great Britain was slightly higher than the previous season, but well below the 246 recorded in 1991-92. In all three seasons, numbers have declined consistently from a late summer or early autumn peak to a low in February or March. This appears to relate to obvious concentrations of birds at key sites gradually dispersing to quiet backwaters, or at least sites not covered by WeBS, during the course of the winter. The

prime locations remain the marshes of north Norfolk, large, parkland lakes and adjacent stretches of river in the centre of the county and the Broads, although numbers fluctuate considerably from one year to the next. In addition to sites in Table 33, Ranworth and Cockshoot Broads (33, December) and the River Wensum from Fakenham to Great Ryburgh (14, July) held 10 or more birds.

Table 33. EGYPTIAN GOOSE: MAXIMA AT MAIN RESORTS

	89-90	90-91	91-92	92-93	93-94	(Mth)	Average
Great Britain†							
Sennowe Park Lakes	-	-	-	58	-		58
Pentney GP	-	47	88	32	-		56
North Norfolk Marshes	54	19	71	19	113	(Aug)	55
St Benet's Levels	-	18	29	54	28	(Aug)	32
Blickling Lake	14	13	23	14	16	(Jan)	16
Nunnery Lakes	-	-	-	-	15	(Sep)	15
Ormesby Br.	-	6	18	-	-		12
Gunton Park Lake	6	17	11	8	12	(Jan)	11
Rutland Water	5	10	9	16	13	(Aug)	11

† as Egyptian Goose is an introduced species in the UK, site designation does not occur and the 1% criterion is not applied. A threshold of 10 has been used as the basis for selecting sites for presentation in this report

RUDDY SHELDUCK

Introduced

Tadorna ferruginea

GB maximum: 7 Aug

NI maximum: 0

The origins of individual Ruddy Shelduck in Britain has been the subject of much debate in recent years. In the past, many occurrences were attributed to genuine irruptions from the Mediterranean and North Africa. More recently, escapes in Britain have confused the issue, the range in Africa has contracted and influxes have been said to result from feral populations on the continent. However, there is growing support for the theory that parties of birds recorded in late summer are from wild populations, with the timing of similar

occurrences in other north European countries and rainfall containing sand from the Sahara given as supporting evidence. Interestingly, the peak in Britain in 1993-94 was recorded in late summer. Ruddy Shelduck were recorded at 15 sites including several southern estuaries, with Stoke Newington Reservoirs (3, January), North Norfolk Marshes (2, August), the Wash (2, August), Stratfield Saye (2, September), Poole Harbour (2, December) and Baston Langtoft Gravel Pits (2, March) holding two or more birds in 1993-94.