

# **Irish Wetland Bird Survey: Results of Waterbird Monitoring in the Republic of Ireland in 2002/03**

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## **Summary**

The Irish Wetland Bird Survey (I-WeBS) is the principal tool for monitoring wintering waterfowl populations and their wetlands in the Republic of Ireland. It has been in operation since 1994/95. This paper summarises the results of the ninth season (2002/03). Coverage was widespread, with a total of 283 sites covered. It was greatest in January, when 79% of sites were counted. A total of 97 waterbird species was recorded, and a peak count of 456,945 was made in January. Lack of January coverage of important wetland sites such as the Shannon and Fergus Estuary, Shannon Callows, River Suck Callows, Southern Roscommon Wetlands and Lough Ree meant that peaks for some species were recorded in other months. In total, there were 16 species that occurred in internationally important numbers and a further 40 in nationally important at one or more sites. A total of 54 internationally important and 68 nationally important sites were identified. These totals are considerably different from those published previously, largely due to the adoption of revised thresholds. Wexford Harbour and Slobs, Dundalk Bay, the Shannon and Fergus Estuary and Lough Foyle supported the greatest numbers overall. Numbers recorded on the Shannon and Fergus Estuary, Lough Corrib, Little Brosna Callows, Lough Swilly and the Shannon Callows appeared low relative to other recent seasons, while those on Bannow Bay, Dungarvan Harbour and Inner Galway Bay were higher.

## **Introduction**

The wetlands of Ireland are a vital resource for hundreds of thousands of waterbird species that migrate here from their arctic and boreal nesting grounds, and also for those waterbirds that pass through on their way to more southerly wintering areas. Ireland's position along the major flyways of these species, along with the mild climate, mean that we have an international responsibility to protect the birds and the wetland habitats that they depend on. These international responsibilities are recognised through the Irish government's ratification in a number of conventions and agreements, including the Ramsar Convention, the EU Birds and Habitats Directives, the Convention on Biological Diversity and, since 1999, the African-Eurasian Migratory Waterbirds Agreement (AEWA) of the Bonn Convention.

A number of different surveys were in existence prior to the initiation of I-WeBS. Waterbirds wintering in Ireland have been monitored since the 1960s but the results of the earliest work are largely unpublished. From 1971/72 to 1974/75 the Wetlands Enquiry, the first fully coordinated survey, took place. These results are documented in *Ireland's Wetlands and their Birds* (Hutchinson 1979). The Wetlands Enquiry began by monitoring estuaries but evolved to incorporate counts of inland wetlands. Monthly counts were carried out, as well as aerial surveys being conducted at more inaccessible places. This survey was then later repeated for the three seasons between 1984/85 and 1986/87 as part of the Winter Wetlands Survey, with the results published in *Ireland's Wetland Wealth* (Sheppard 1993). These formative schemes provided a baseline for future surveys and helped to identify a large network of important wetland sites. Since this monitoring took place, and indeed in the time between the two schemes, there has been constant pressure on Ireland's wetlands from disturbance, pollution, and the threat of development. A need was realised for an on-going system to be put in place that could identify long-term information and trends.

The Irish Wetland Bird Survey (I-WeBS) commenced in 1994/95. Its aim is to monitor the numbers and distribution of non-breeding waterbird populations wintering in Ireland and to highlight long-term trends. The data generated are used to identify wetland sites of importance according to internationally agreed selection criteria. The data are also used for site designation purposes and form the basis for informed decision-making by planners, conservationists and developers on the sustainable use and management of wetlands and their waterbird communities. Some waterbirds are harder to count than others due to them being more dispersed. These more cryptic species are targeted through extra species-specific surveys that are carried out as part of the I-WeBS season. This paper presents the results of the ninth I-WeBS season, 2002/03.

## **Methods**

The methods used have been described in detail in Crowe and Boland (2004). Trend analyses were not carried out for the 1994/95-2002/03 period. These will be presented in a more detailed report due for publication in 2006.

## Results

### *Weather*

The 2002/03 season was mild overall with rainfall totals being lower than normal in most months. October was the exception to this with rainfall being above normal everywhere. This rain continued into November and December, but was concentrated in the east and south of the country. September, January, February and March were mostly dry. January and February were mild with low rainfall but with severe ground frosts at times. February had high sunshine levels and the season ended with the sunniest March for over 20 years with cloud-free conditions due to an anti-cyclone that dominated the weather over Ireland (*Met Éireann*).

### *Coverage*

Coverage in 2002/03 was marginally lower than in 2001/02. A total of 283 sites, comprising 789 subsites was covered (Fig. 1). This included 56 estuaries, 134 lakes/turlough complexes and 59 riverine sites. Remaining habitats covered included non-estuarine sections of coast, reservoirs, gravel pits, marsh and grasslands (swan and goose feeding areas).

In total, 56 sites were covered during all months, while 80 sites were covered during one month only. Greatest coverage was achieved in January, when 223 sites (79% of total covered) were counted. This excludes some sites with large concentrations, including the Shannon and Fergus Estuary, Shannon Callows and River Suck Callows, which were covered by aerial survey in February, and also the Southern Roscommon Wetlands and Lough Ree. The majority of important wintering sites were covered, with the exception of the Sligo Bays, Lough Iron and the Mid-Clare Coast.

### *Total numbers*

A total of 97 species was recorded, including 54 wildfowl, 26 wader, 11 gull and 5 tern species, and also Kingfisher *Alcedo atthis* (Table 1). A peak waterbird count of 456,945 was recorded in January. This comprised 32% wildfowl (including allies), 58% waders and 11% gulls (Table 1).

Peak counts of most species were recorded in January. The most notable exceptions (where the peak count was substantially different from the January total) include Little Egret *Egretta garzetta*, Light-bellied Brent Goose *Branta branta hrota*, Tufted Duck *Aythya fuligula*, Coot *Fulica atra*, Golden Plover *Pluvialis apricaria*, Black-tailed Godwit *Limosa limosa* and Redshank *Tringa totanus*. However, the peaks presented for some species (e.g. swan and goose species, Golden Plover, Lapwing *Vanellus vanellus* and Purple Sandpiper *Calidris maritima*) are substantially underestimated as large proportions of their populations are not present on wetland sites monitored during regular I-WeBS counts (Colhoun and Newton 2000, Colhoun *et al.* 2000, Merne and Walsh 2003).

When compared with the earliest 5-season mean (1994/95 to 1998/99), counts of some species in 2002/03, in particular Bewick's Swan *Cygnus columbianus*, Scaup *Aythya marila*, Common Scoter *Melanitta nigra*, Coot, Lapwing and Purple Sandpiper, were low. In contrast, numbers of Little Egret, Light-bellied Brent Goose, Gadwall *Anas strepera*, Oystercatcher *Haematopus ostralegus*, Sanderling *Calidris alba*, Black-tailed Godwit and Bar-tailed Godwit *Limosa lapponica* appear to have increased.

Internationally important concentrations of 16 species and nationally important of 40 species occurred at one or more sites in 2002/03 (Table 2). Internationally important numbers of Light-bellied Brent Goose and Black-tailed Godwit, and nationally important numbers of Wigeon *Anas penelope*, Golden Plover, Ringed Plover *Charadrius hiaticula*, Teal *Anas crecca* and Sanderling were present at the greatest number of sites (Table 2).

### *Principal sites*

A total of 54 internationally important and 68 nationally important sites was identified (based on the 1998/99-2002/03 five-season mean) (Table 3). This included 13 sites which supported 20,000 waterbirds. Wexford Harbour and Slobs, Dundalk Bay, the Shannon and Fergus Estuary and Lough Foyle supported the greatest numbers of waterbirds overall, and Lough Corrib, the Little Brosna Callows and the Shannon Callows were the only inland sites on this list (Table 3). These, and a further 41 sites, supported at least 1% of the flyway population of one or more waterbird species. The Wexford Harbour and Slobs supported the greatest number of significant waterbird concentrations, supporting internationally important numbers of seven species and nationally important numbers of a further 16 species. The sum of species peaks recorded at each site in 2002/03 remained relatively consistent when compared with earlier seasons. Notable exceptions include an apparent decline in numbers at the Shannon and Fergus Estuary, Lough Corrib, Little Brosna Callows, Lough Swilly and the Shannon Callows. In contrast, increases were evident at Bannow Bay, Dungarvan Harbour and Inner Galway Bay, all which supported in excess of 20,000 waterbirds during the 2002/03 season (Table 3).

There is a substantial difference in the number of internationally and nationally important sites when compared with the results of previous seasons. This is largely due to the changing thresholds of some species. Nine sites have been promoted to international importance due to the significant decline in the flyway threshold of Black-tailed Godwit, and also due to the elevation of the Irish Mute Swan *Cygnus olor* population as a distinct population from the remainder of northwest Europe. In contrast, 30 sites are no longer of significant importance (when compared with 2001/02, Crowe and Boland 2004), of which 12 have declined in status due to increased species thresholds, while actual declines were evident in a further six sites. Remaining sites have been removed from the list due to lack of recent coverage or irregular site usage (e.g. goose usage of grassland sites). Other sites worth mentioning are those of significant importance for Moorhen *Gallinula chloropus*, a highly dispersed and skulking species for which no national threshold has yet been derived. These include the Dublin Zoo ponds, River Boyne, Grand Canal (Dublin), Tymon Park, Knock Lake and the Arklow Ponds.

## Discussion

Fewer sites were covered during the 2002/03 season when compared with 2001/02. Sites not covered mostly included small wetlands with low numbers of waterbirds. However, the lack of coverage of some sites which at times support large numbers of waterbirds, such as Lough Iron, the Mid-Clare Coast, the southeast Clare Lakes and Sligo Bays, may have resulted in the lower totals recorded overall.

The revised flyway population estimates (Wetlands International 2002) for some species have changed considerably since those previously published (Rose and Scott 1997). It has recently been shown that the majority of Black-tailed Godwits wintering in Iberia and Morocco are from the west European *limosa* population (Stroud et al. 2001, Wetlands International 2002). These birds were formerly associated with the Icelandic population *islandica* which winters in Ireland. Therefore, despite an actual increase in the latter population, the threshold has declined significantly. Furthermore, the Mute Swan population in Ireland has recently been classified as being mostly resident, and isolated from the main European population to which it was formerly assigned. On this basis, a further two sites, namely the Ballyhaunis Lakes and River Slaney qualify for internationally important status. However, because of its resident status, the Mute Swan now does not afford the protection of a migratory waterbird species. As a result of these revised population estimates, there was an increase in the number of internationally important concentrations when compared with data based on the previous thresholds.

The revised all-Ireland population sizes of several species (see interim levels presented in Crowe 2005) were shown to increase since the previous estimates (Colhoun 2001). Increased thresholds for Great Crested Grebe *Podiceps cristatus*, Pochard *Aythya ferina*, Tufted Duck, Ringed Plover, Sanderling and Purple Sandpiper were most responsible for the decline in the number of nationally important sites when compared with previous seasons (Colhoun 2002, Crowe and Boland 2004).

It is likely that these increased thresholds will be short-lived. Recent declines in Pochard and Tufted Duck at Lough Neagh, their stronghold site in Ireland, have been reported (Allen *et al.* 2004). It has been implied there has been a distributional shift in both these species as climate change has rendered areas closer to their northeastern breeding grounds more suitable for wintering. Similar redistribution trends have been predicted for other species wintering between northern Europe and Siberia, including all three wader species mentioned above (Rehfishch *et al.* 2004).

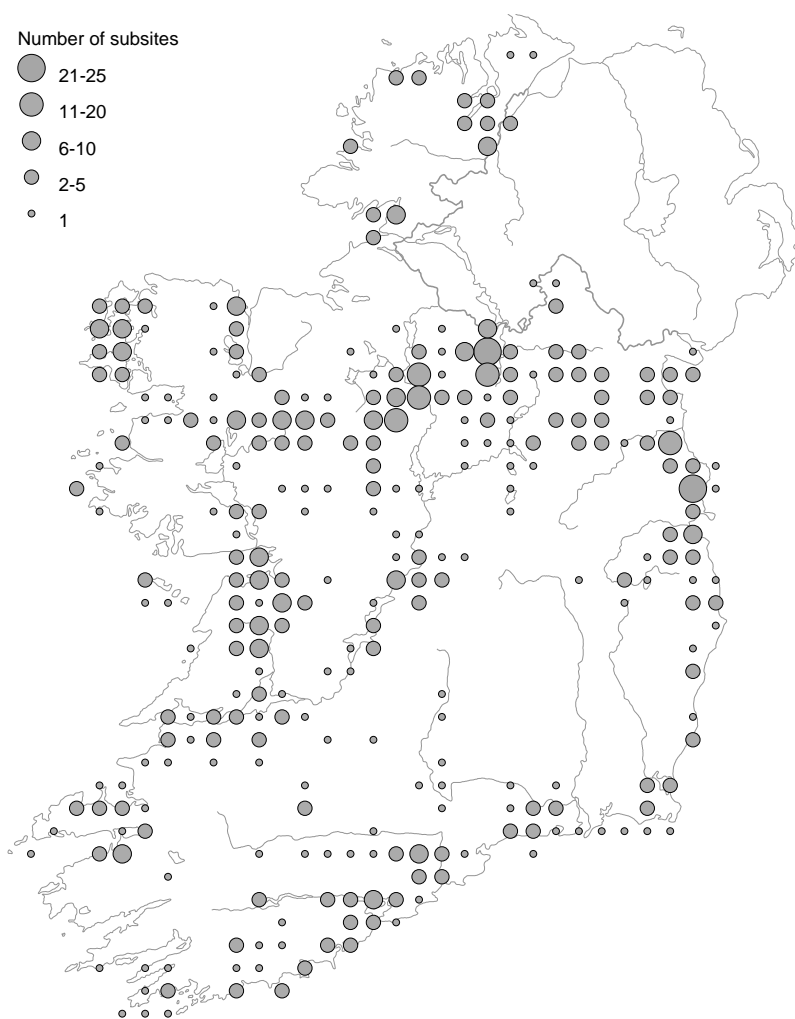
## References

- Allen, D., C. Mellon, I. Enlander, G. Watson. 2004. Lough Neagh diving ducks: recent changes in wintering populations. *Irish Birds* 7: 327-336.
- Colhoun K. 2001. *Irish Wetland Bird Survey, 1998 – 99. Results from the fifth winter of the Irish Wetland Bird Survey.* BirdWatch Ireland, Dublin.
- Colhoun K. 2001b. Irish Wetland Bird Survey, 1999 – 2000. Summary of the sixth I-WeBS season. *I-WeBS News* 6: 2 – 14.
- Colhoun K. 2002. Waterbird monitoring in Ireland 2000/01: results of the seventh year of the Irish Wetland Bird Survey (I-WeBS). *Irish Birds* 7: 43 – 52.
- Colhoun K. and SF Newton. 2000. Winter waterbird populations on non-estuarine coasts in the Republic of Ireland: results of the 1997 – 98 Non-Estuarine Coastal Waterfowl Survey (NEWS). *Irish Birds* 6, 527 – 542.
- Colhoun K, McElwaine JG, Cranswick PA, Enlander I, Merne OJ. 2000. Numbers and distribution of Whooper *Cygnus Cygnus* and Bewick's Swans *C. columbianus bewickii* in Ireland: results of the International Swan Census, January 2000. *Irish Birds* 6: 485 – 494.
- Crowe O. 2005. *Ireland's Wetlands and Their Waterbirds: Status and Distribution.* BirdWatch Ireland, Newcastle, Co. Wicklow.
- Crowe O and Boland H. 2004. Irish Wetland Bird Survey: Results of waterbird monitoring in Ireland in 2001/02. *Irish Birds* 7: 313-326.

- Hutchinson CD 1979. *Ireland's Wetlands and their Birds*. Irish Wildbird Conservancy, Dublin.  
*Met Éireann*. Monthly Weather Bulletins.
- Merne OJ, Walsh A. 2003. Barnacle Geese *Branta leucopsis* in Ireland, Spring 2003. *Irish Birds* 7: 173 – 176.
- Rehfishch, M. M., G. E. Austin, S. N. Freeman, M. J. S. Armitage and N. H. K. Burton. 2004. The possible impact of climate change on the future distributions and numbers of waders on Britain's non-estuarine coast. *Ibis* 146 (Supplement 1), 70-81.
- Rose PM, Scott DA. 1997. *Waterfowl Population Estimates- Second Edition*. Wetlands International Publ. 44, Wageningen, The Netherlands.
- Stroud, D. A., D. Chambers, S. Cook, N. Buxton, B. Fraser, P. Clement, P. Lewis, I. McLean, H. Baker and S. Whitehead. 2001. *The UK SPA network: its scope and content*. Joint Nature Conservation Committee, Peterborough.
- Sheppard R. 1993. *Ireland's Wetland Wealth: the birdlife of the estuaries, lakes, coasts, rivers, bogs and turloughs of Ireland*. Irish Wildbird Conservancy, Dublin.
- Wetlands International. 2002. *Waterfowl population estimates - Third Edition*. Wetlands International Global Series No. 12, Wageningen, The Netherlands.

### **Acknowledgements**

I-WeBS is a joint project of BirdWatch Ireland, the National Parks and Wildlife Service of the Department of the Environment, Heritage and Local Government and the Wildfowl and Wetlands Trust. We are extremely grateful to all I-WeBS Regional Organisers and counters. Space limits listing these names, but we sincerely thank all who were involved. We are grateful to Mark Collier and Andy Musgrove for providing data for the two cross-border sites Lough Foyle and Carlingford Lough.



**Figure 1.** Coverage by 10-km squares of subsites covered during I-WeBS in 2002/03.

**Table 1.** Total numbers of waterbirds counted during I-WeBS in the Republic of Ireland in 2002/03.

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	
<i>No. sites</i>	105	125	161	156	229	162	134	
<i>No. subsites</i>	256	338	422	378	655	414	328	
Red-throated Diver	<i>Gavia stellata</i>	13	35	76	28	138	52	93
Black-throated Diver	<i>Gavia arctica</i>	1		7	16	10		
Great Northern Diver	<i>Gavia immer</i>	16	35	141	208	371	134	200
Little Grebe	<i>Tachybaptus ruficollis</i>	438	351	464	511	767	396	784
Great Crested Grebe	<i>Podiceps cristatus</i>	484	391	676	654	1,081	637	390
Slavonian Grebe	<i>Podiceps auritus</i>		10		5	7	3	
Black-necked Grebe	<i>Podiceps nigricollis</i>					2		
Cormorant	<i>Phalacrocorax carbo</i>	2,309	2,183	2,181	1,696	2,959	1,623	1,820
Grey Heron	<i>Ardea cinerea</i>	550	567	581	577	602	275	306
Little Egret	<i>Egretta garzetta</i>	146	161	111	85	136	318	81
Mute Swan	<i>Cygnus olor</i>	1,161	2,769	2,219	1,927	2,837	2,426	1,160
Black Swan	<i>Cygnus atratus</i>	1			1	1	1	1
Bewick's Swan	<i>Cygnus columbianus</i>		63	62	111	172	12	
Whooper Swan	<i>Cygnus cygnus</i>	2	1,218	3,570	2,658	4,390	2,272	980
Bean Goose	<i>Anser fabalis</i>				1			

Pink-footed Goose	<i>Anser brachyrhynchus</i>		6	4	7	7	7	10
European White-fronted Goose	<i>Anser anser albrifrons</i>				1	1	1	
Greenland White-fronted Goose	<i>Anser anser flavirostris</i>	2	3,630	7,114	6,552	9,290	8,801	8,749
Greylag Goose	<i>Anser anser</i>	28	542	1,622	1,872	4,669	1,455	3,373
Snow Goose	<i>Anser caerulescens</i>		1	2	2	2	2	2
Canada Goose	<i>Branta canadensis</i>	32	5	43	261	178	11	43
Barnacle Goose	<i>Branta leucopsis</i>		110	510	1,410	2,753	2,213	635
Dark-Bellied Brent Goose	<i>Branta bernicla bernicla</i>					2	1	1
Black Brant	<i>Branta bernicla nigricans</i>					1		
Light-bellied Brent Goose	<i>Branta branta hrota</i>	17	1,126	5,684	12,753	10,528	8,293	7,703
Feral/hybrid Goose			19	43	22	23	7	27
Shelduck	<i>Tadorna tadorna</i>	169	649	3,675	6,723	6,882	6,511	2,989
Wigeon	<i>Anas penelope</i>	3,474	10,311	32,553	29,201	37,197	28,106	3,111
American Wigeon	<i>Anas americana</i>	1	1	1	1	2	1	2
Gadwall	<i>Anas strepera</i>	116	55	222	293	411	250	133
Teal	<i>Anas crecca</i>	2,938	8,205	12,343	14,453	20,998	12,893	3,956
Green-winged Teal	<i>Anas carolinensis</i>			2			1	
Mallard	<i>Anas platyrhynchos</i>	7,717	6,769	9,087	7,995	10,739	5,804	2,386
Black Duck	<i>Anas rubripes</i>				1	1	1	
Pintail	<i>Anas acuta</i>	37	114	554	245	634	428	62
Garganey	<i>Anas querquedula</i>						1	
Shoveler	<i>Anas clypeata</i>	73	228	852	1,324	1,380	691	268
Red Crested Pochard	<i>Netta rufina</i>	1	1			1		
Pochard	<i>Aythya ferina</i>	38	3,865	3,262	1,403	4,975	2,696	155
Ring-necked Duck	<i>Aythya collaris</i>			2	1		3	2
Tufted Duck	<i>Aythya fuligula</i>	1,143	1,283	10,686	3,382	8,956	5,652	2,601
Scaup	<i>Aythya marila</i>	1	48	243	91	593	88	15
Eider	<i>Somateria mollissima</i>			12	7	3		6
Long-tailed Duck	<i>Clangula hyemalis</i>			10	13	23	9	10
Common Scoter	<i>Melanitta nigra</i>	2,827	2,638	3,408	1,592	3,103	602	1,899
Velvet Scoter	<i>Melanitta fusca</i>							3
Goldeneye	<i>Bucephala clangula</i>	2	76	737	720	1,250	1,032	246
Smew	<i>Mergus albellus</i>				1	4	1	
Red-breasted Merganser	<i>Mergus serrator</i>	300	388	681	762	985	452	558
Goosander	<i>Mergus merganser</i>			4		6		
Ruddy Duck	<i>Oxyura jamaicensis</i>			1		1		
Hybrid duck				1	3	1	92	25
Coot	<i>Fulica atra</i>	1,673	6,967	5,541	7,889	4,553	1,849	600
Moorhen	<i>Gallinula chloropus</i>	437	459	399	382	432	351	369
Water Rail	<i>Rallus aquaticus</i>	20	11	30	19	12	37	15
<b>Total wildfowl</b>		<b>26,167</b>	<b>55,290</b>	<b>109,416</b>	<b>107,854</b>	<b>144,065</b>	<b>96,497</b>	<b>45,772</b>
Oystercatcher	<i>Haematopus ostralegus</i>	19,732	22,839	23,666	12,591	27,072	24,231	14,404
Avocet	<i>Recurvirostra avosetta</i>				1			
Ringed Plover	<i>Charadrius hiaticula</i>	2,270	2,534	2,826	2,609	3,545	2,150	624
Golden Plover	<i>Pluvialis apricaria</i>	472	19,704	65,947	56,987	58,875	72,285	21,582
Grey Plover	<i>Pluvialis squatarola</i>	271	503	986	2,468	2,334	2,018	307
Lapwing	<i>Vanellus vanellus</i>	1,171	7,509	45,112	49,329	66,183	40,263	1,117
Knot	<i>Calidris canutus</i>	2,998	1,844	14,302	6,014	12,108	10,590	3,842
Sanderling	<i>Calidris alba</i>	1,042	1,180	1,414	1,603	1,863	1,452	973
Curlew Sandpiper	<i>Calidris ferruginea</i>	36	5			1	1	
Purple Sandpiper	<i>Calidris maritima</i>	10	2	13	66	54	32	34
Dunlin	<i>Calidris alpina</i>	1,729	5,053	24,133	28,696	44,667	36,037	4,335
Ruff	<i>Philomachus pugnax</i>	11	19	26	10	19	3	1
Jack Snipe	<i>Lymnocyptes minimus</i>			13	24	22	22	16

Snipe	<i>Gallinago gallinago</i>	42	299	462	594	1,075	548	291
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>							1
Woodcock	<i>Scolopax rusticola</i>			2	1		2	1
Black-tailed Godwit	<i>Limosa limosa</i>	5,710	6,892	10,975	6,415	7,728	10,791	7,095
Bar-tailed Godwit	<i>Limosa lapponica</i>	3,317	3,925	7,308	7,816	12,501	12,020	2,337
Whimbrel	<i>Numenius phaeopus</i>	76	5	3	1			7
Curlew	<i>Numenius arquata</i>	10,236	11,631	12,510	9,374	14,771	17,104	3,729
Spotted Redshank	<i>Tringa erythropus</i>	4	5	8	4	12	1	1
Redshank	<i>Tringa totanus</i>	9,044	13,369	10,900	7,393	9,095	8,656	8,356
Greenshank	<i>Tringa nebularia</i>	291	363	313	312	390	301	222
Green Sandpiper	<i>Tringa ochropus</i>	5	8	4	4	12	2	1
Common Sandpiper	<i>Actitis hypoleucos</i>	16	1	2		6	48	1
Turnstone	<i>Arenaria interpres</i>	597	1,223	1,794	1,491	1,784	1,574	935
<b>Total waders</b>		<b>59,080</b>	<b>98,913</b>	<b>222,719</b>	<b>193,803</b>	<b>264,117</b>	<b>240,131</b>	<b>70,212</b>
<b>Total wildfowl &amp; waders</b>		<b>85,247</b>	<b>154,203</b>	<b>332,135</b>	<b>301,657</b>	<b>408,182</b>	<b>336,628</b>	<b>115,984</b>
Unidentified gull	<i>Larus sp.</i>	110		52	10			
Mediterranean Gull	<i>Larus melanocephalus</i>	14	9	7	7	5	6	5
Little Gull	<i>Larus minutus</i>					2		2
Black-headed Gull	<i>Larus ridibundus</i>	12,432	14,790	14,985	12,820	26,147	16,719	5,124
Ring-billed Gull	<i>Larus delawarensis</i>			1	3	2	4	3
Common Gull	<i>Larus canus</i>	1,135	3,696	3,705	4,738	16,922	10,692	3,446
Lesser Black-backed Gull	<i>Larus fuscus</i>	1,267	4,131	1,300	1,233	2,449	2,874	664
Herring Gull	<i>Larus argentatus</i>	649	1,361	1,604	839	2,244	1,971	2,203
Yellow-legged Gull	<i>Larus arg. Cachinnans michahellis</i>				1		2	
Iceland Gull	<i>Larus glaucoides</i>							2
Glaucous Gull	<i>Larus hyperboreus</i>						2	
Great Black-backed Gull	<i>Larus marinus</i>	451	662	1,199	873	981	778	772
<b>Total gulls</b>		<b>16,058</b>	<b>24,649</b>	<b>22,853</b>	<b>20,524</b>	<b>48,752</b>	<b>33,048</b>	<b>12,221</b>
Sandwich Tern	<i>Sterna sandvicensis</i>	304	23					38
Roseate Tern	<i>Sterna dougallii</i>		62					
Common Tern	<i>Sterna hirundo</i>	28	46	1			2	
Arctic Tern	<i>Sterna paradisaea</i>	20						
Forster's Tern	<i>Sterna forsteri</i>				1	2		
<b>Total terns</b>		<b>352</b>	<b>131</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>38</b>
Kingfisher	<i>Alcedo atthis</i>	16	16	16	10	9	5	4
<b>Total waterbirds</b>		<b>101,673</b>	<b>178,999</b>	<b>355,005</b>	<b>322,192</b>	<b>456,945</b>	<b>369,683</b>	<b>128,247</b>

**Table 2.** Concentrations of waterfowl counted in each year, 1998/00-2002/03 which attained threshold levels for international and interim all-Ireland importance levels. The most recent threshold values are used (see Crowe 2005 for details).

	<u>No. internationally important concentrations</u>					<u>No. nationally important concentrations</u>				
	1998/ 99	1999/ 00	2000/ 01	2001/ 02	2002/ 03	1998/ 99	1999/ 00	2000/ 01	2001/ 02	2002/ 03
Red-throated Diver						5	8	4	4	7
Great Northern Diver	2	3	2	2	2	6	6	1	3	3
Little Grebe						12	9	5	8	6

Great Crested Grebe						8	8	6	7	10
Cormorant						8	9	10	7	9
Grey Heron							1	2	1	1
Mute Swan	8	9	5	4	4					
Bewick's Swan						1	2	1	2	2
Whooper Swan	7	9	8	10	10	10	7	5	6	8
Greenland White-fronted Goose	5	5	3	4	3	3	2	6	2	3
Greylag Goose	3	3	2	3	1	14	14	16	10	13
Barnacle Goose	1	3	1	1	2	7	4	1	4	5
Light-bellied Brent Goose	22	25	22	25	23					
Shelduck						14	16	13	9	17
Wigeon						23	27	16	19	23
Gadwall						8	9	8	14	14
Teal						24	23	22	11	17
Mallard						3	5	3	2	3
Shoveler			2		1	23	18	16	18	15
Pochard	1	1	1	1	1	3	2		6	3
Tufted Duck						7	5	3	6	5
Scaup						4	2	4	2	4
Eider						1			1	1
Long-tailed Duck						2	1	2		1
Common Scoter						9	9	8	5	9
Goldeneye						7	6	2	6	5
Red-breasted Merganser						12	12	11	8	12
Coot	1					7	6	4	5	8
Moorhen						14	19	6	12	13
Oystercatcher		1			1	16	16	10	9	11
Ringed Plover	1			1	1	11	15	17	13	13
Golden Plover	4	4	2	2	2	27	32	23	32	29
Grey Plover						15	16	10	16	16
Lapwing		1				24	21	15	17	16
Knot	1	1	1	1	2	9	11	9	8	6
Sanderling						11	9	12	12	17
Purple Sandpiper						3	4	1	1	1
Dunlin	1	2				19	15	12	10	18
Black-tailed Godwit	22	15	13	19	16	5	5	3	3	7
Bar-tailed Godwit	3	3	2	2	6	15	16	14	13	12
Curlew						19	20	14	16	14
Redshank	3	2	3	1	4	13	13	10	13	16
Greenshank						14	12	10	15	15
Turnstone						12	12	4	6	8
Lesser Black-backed Gull	1		1	1						
<b>Total concentrations</b>	<b>86</b>	<b>87</b>	<b>68</b>	<b>77</b>	<b>79</b>	<b>448</b>	<b>447</b>	<b>339</b>	<b>362</b>	<b>416</b>
<b>Overall sites</b>	<b>49</b>	<b>53</b>	<b>41</b>	<b>46</b>	<b>38</b>	<b>115</b>	<b>119</b>	<b>96</b>	<b>99</b>	<b>104</b>
<b>Overall species</b>	<b>17</b>	<b>16</b>	<b>15</b>	<b>15</b>	<b>16</b>	<b>41</b>	<b>41</b>	<b>40</b>	<b>41</b>	<b>40</b>

**Table 3.** Total numbers of waterbirds at principal wetlands counted by I-WeBS, 1998/99 - 2002/03. Totals are derived from summed annual maxima of each species across all months Sep - Mar inclusive in each year. Species codes are given below, with those shown in lower- and upper-case indicating occurrence in nationally and internationally important numbers respectively. Asterisks illustrate incomplete counts. Data for Lough Foyle and Carlingford Lough were supplied by the WeBS Secretariat.

ND	Great Northern Diver	BY	Barnacle Goose	SP	Scaup	L.	Lapwing
LG	Little Grebe	PB	Light-bellied Brent Goose	LN	Long-tailed Duck	KN	Knot
GG	Great Crested Grebe	SU	Shelduck	E.	Eider	SS	Sanderling
CA	Cormorant	WN	Wigeon	CX	Common Scoter	PS	Purple Sandpiper
H.	Grey Heron	GA	Gadwall	GN	Goldeneye	DN	Dunlin
MS	Mute Swan	T.	Teal	RM	Red-breasted Merganser	BW	Black-tailed Godwit
BS	Bewick's Swan	MA	Mallard	CO	Coot	BA	Bar-tailed Godwit
WS	Whooper Swan	PT	Pintail	OC	Oystercatcher	CU	Curlew

NW Greenland White-fronted Goose  
GJ Greylag Goose

SV Shoveler  
PO Pochard  
TU Tufted Duck

RP Ringed Plover  
GP Golden Plover  
GV Grey Plover

RK Redshank  
GK Greenshank  
TT Turnstone

Site	1998/99	1999/00	2000/01	2001/02	2002/03	Mean	Species
<b>Internationally important sites supporting &gt;20,000 waterbirds</b>							
Wexford Harbour & Slobs	41,583*	32,716*	24,515*	32,835*	51,459	51,459	gg, ca, MS, bs, WS, NW, PB, su, wn, ga, t., ma, sp, rm, rp, GP, gv, l., dn, BW, BA, cu, rk
Dundalk Bay	46,682	66,903	42,832	45,650	47,016	49,817	gg, gj, PB, su, t., ma, cx, rm, oc, rp, gp, gv, l., KN, dn, BW, BA, cu, RK
Shannon & Fergus Estuary	54,973	44,719	44,784	37,128	13,290	38,979	ca, PB, su, wn, t., sv, gp, gv, l., kn, dn, BW, cu, rk, gk
Lough Foyle†	41,933	34,963	40,144	26,765	36,655	36,092	gg, WS, gj, PB, su, wn, t., ma, ln, e., oc, gp, dn, BA, cu, rk, gk
Lough Corrib	46,233	34,590	35,158	43,386	19,439	35,761	MS, ga, PO, tu, co, gp, l.
Dublin Bay	27,942	29,357	26,254	30,331	36,072	29,991	PB, su, t., sv, rm, oc, rp, gp, gv, kn, ss, dn, BW, BA, cu, RK, tt
Little Brosna Callows	33,681	38,221	27,380	24,451	21,658	29,078	NW, wn, t., sv, GP, l., BW
Tralee Bay, Lough Gill & Akeragh Lough	42,416	31,157	25,700	19,044	23,758	28,415	by, PB, wn, ga, t., sp, oc, rp, gp, l., ss, dn, bw, ba, cu, rk, gk, tt
Cork Harbour	31442*	30339*	28,686*	26,476	29,551	28,014	lg, gg, ca, su, wn, ga, t., sv, rm, oc, gp, l., dn, BW, ba, cu, rk, gk
Lough Swilly	28,420	28,513	28,515	29,251	23,960	27,732	rh, gg, WS, NW, GJ, PB, su, wn, t., ma, rm, co, oc, dn, cu, rk, gk
Ballymacoda	26,688	26,682	26,710	18,149	20,725	23,791	su, wn, t., GP, gv, l., ss, dn, BW, ba, cu, rk, LB
Shannon Callows	21,965	31,835		26,816	9,218	22,459	MS, ws, wn, gp, l., BW
Rogerstown Estuary	11018*	11947*	23,861	21,441	15,903	20,402	gj, PB, su, wn, ga, t., sv, oc, rp, gv, l., kn, ss, dn, BW, cu, rk, gk, tt
<b>Other internationally important sites</b>							
Bannow Bay	18,729	13,086		1,669*	26,433	19,416	PB, su, gp, gv, l., dn, ba, cu, rk
Dungarvan Harbour	17,476	15,349		19,375	23,064	18,816	PB, su, rm, oc, gp, gv, l., kn, dn, BW, ba, cu, rk
Inner Galway Bay	10,869	20,047	15,301	21,352	24,607	18,435	ND, lg, ca, h., PB, wn, t., sv, rm, rp, gp, gv, l., dn, ba, cu, rk, gk, tt
Boyne Estuary	23,648	12,224	18,053	20,833	11,034	17,158	PB, su, oc, gp, gv, l., kn, ss, BW, rk, tt
The Cull & Killag	17,293	15,137		76*	15,246	15,892	su, rp, gp, l., BW, ba
Tacumshin Lake	35,998	12,683		1,423	3,935	13,510	lg, ws, wn, ga, t., sv, co, gp, gv, l., BW
Courtmacsherry Bay, Broadstrand Bay & Dunworley	16,069	14,459	10,135	11,737	8,459	12,172	nd, su, rm, gp, BW, cu, gk
Castlemaine Harbour & Rossbehy	17,432	8,710	10,998	12,481	9,609	11,846	PB, wn, cx, ss, gk
Rahasane Turlough	4,827	15,839	14,114	12,185	16,660*	11,741	nw, wn, gp, BW
Killala Bay	11,861	15,223	8,858	11,523	9,529	11,399	PB, rm, rp, gp, gv, l., kn, dn, ba, cu, rk, gk
Broadmeadow (Malahide) Estuary	14,126	9,394	10,474	13,156	9,633	11,357	gg, PB, su, gn, rm, oc, gv, kn, dn, BW, ba, rk, gk
Blackwater Estuary	14,907	7,659	11,286	7,979	8,960	10,158	gp, BW, ba, cu, rk, gk
Carlingford Lough†	9,172	9,955	8,434	9,763	10,748	9,614	ca, gg, PB, su, sp, rm, oc, rp, dn, rk, tt
The Mullet, Broadhaven & Blacksod Bays	5207*	8,644	9,225	8,111	11,555	9,384	ND, ca, BY, PB, cx, rm, rp, gp, ss, ba, cu, gk
Baldoyle Bay	6,592	7,859	5,751	8,891	6,825	7,184	PB, su, rp, gp, gv, ba
Ballysadare Bay	6,091	7,517	5,940			6,516	PB, dn, ba, rk, gk
Tramore Back Strand & Bay	8,693	11,246	78	6,643	5,487	6,429	PB, gp, gv, bw, ba
Lough Iron	6,608	4,948		325*		5,778	NW, sv

North Wicklow Coastal Marshes	5,726	5,103	5,633	4,788	5,033	5,257	rh, gj, PB, wn, t.
North Central Galway Lakes	6,488	3,494	9,323	3,709	2,539	5,111	WS, gp
Sligo Harbour	6,360	3,804	4,720			4,961	PB, oc, rk, gk
Corofin Wetlands	9,171	4,841	3,508	2,117	2,248	4,377	wn, ga, BW
Clonakilty Bay	8,294	28	7,201	4,768	877	4,234	BW
Lough Ennell	5,271	1,636*		5,375	1,999	4,215	MS, po, tu
River Foyle	3,789	4,498	3,160	4,298	4,441	4,037	WS, gj
Donegal Bay	4,747	4,056	3,161		3,432	3,849	ND, PB, cx
Kells	3,170	3,988				3,579	wn, BW
Drumcliff Bay Estuary	3,379	5,440	1,838	137*		3,552	BY, ss, ba
Lough Oughter Complex	4,255	4,227	3,515	3,288	2,295	3,516	gg, WS, gn
Ballyallia Lake	7,288	46	5,539	768	2,421	3,212	wn, ga, t., sv, BW
Blackwater Callows	2,922	2,783	3,709	2,654	3,456	3,105	WS, wn, BW
Ballyhaunis Lakes	3,026	2,876	3,154	3,003	2,534	2,919	MS
Hicks Tower, Robswall	1,183	2,742	2,239	5,043	2,303	2,702	PB, oc, gv
Skerries Islands	3,087	2,965	2,102	2,503	2,763	2,684	ca, PB, tt
Stabannan-Braganstown	2,444	3,398	4,190	362	2,330	2,545	GJ
Trawbreaga Bay	2,620	2,691		991	2,969	2,318	BY, PB
River Slaney	1,611	2,212				1,912	MS, t.
Seagrang Park	867	1,668	1,590	1,329	1,646	1,420	PB, BW
Glen Lough	724	1,088		10	11	458	WS
Yellow River				249		249	WS
River Blackwater					241	241	WS
<b>Nationally important sites (&gt;1,000 waterbirds)</b>							
Southern Roscommon Lakes	5,839*	20,438	14,196		13,027	15,887	t., sv, gp, l.
Lough Ree	13,363	9,651	22,020	8,476	10,275*	13,378	lg, ws, wn, t., ma, sv, tu, gn, gp, l.
Cahore Marshes	13,090*	4,863*	10,682	11,929	6,203*	11,306	sv, gp
Barrow Estuary	10,932	8,726				9,829	gp, l., dn, bw
Inishcarra Reservoirs	5,676*	6,574	11,556	9,982	8,198*	9,371	t., gp
River Suck		4,777		9,836	8,544	7,719	wn, gp, l.
Ballycotton Shanagarry	7,058	6,121	5,904	7,064	9,127	7,055	t., gv, ss, bw, cu
Nanny Estuary & shore	7,052	6,002	4,974	9,867	4,580	6,495	cx, oc, rp, gp, kn, ss
Mid-Clare Coast (Mal Bay - Doonbeg Bay)	11,394	5,304*		676		6,035	ss, ps, tt
Lough Derravaragh	6,449	7,356		3,107	2,373*	5,637	po, co
River Maigue		1,276		8,735		5,006	ga, gp
Wexford Bay	5,636	7,480	5,933	4,519	525	4,819	rh, cx
Lough Derg (Shannon)	4,699	5,373	542*	5,433	2,437	4,486	tu, gn, gv
River Barrow (Checkpoint-New Ross)						4,269	bw
Delvin River - Hampton Cove	6,459	5,635	2,039	4,975	1,523	4,126	ca, gp
Lough Owel	1,481	2,378		5,183	6,407	3,862	sv, co
Lough Sheelin	2,441	1,799	2,240	5,072	7,578	3,826	lg, gg, ca, po, tu, gn
Rosscarbery	3,890	3,227	3,738	3,798	3,850	3,701	gp
Lower Blackwater River	5,886	4,475	3,191	2,149	2,562	3,653	ca, bw
Charleville Lagoons	1,608	3,124	3,359	6,570	2,719	3,476	sv
River Suir Lower	5,202	3,570	547	3,156	4,066	3,308	gj
Clew Bay	1,196	1,893	4,279	4,749	3,996	3,223	nd, by, rm, rp
Dunany Point - Clogher Head	846	6,683		2,737	2,148	3,104	cx, gp
Rostaff Lake	3,636	3,867	2,938	2,133	1,581	2,831	sv
Annaghmore Lakes	4,506	3,438	1,521	1,597	2,508*	2,766	sv
Lough Rea	2,221	2,957	2,526	3,291	2,780	2,755	sv, co
Fortwilliam Turlough	1,747	3,632	3,299	1,393		2,518	gp
Boyne Estuary - Skerries			2,508			2,508	cx
Castleplunket Turloughs	2,581	2,997	2,518		1,445	2,385	wn
Carrownacon Lakes			2,207		832*	2,207	gp
Lady's Island Lake	2,828	5,444	715	817	1,089	2,179	ga
South Mayo Coast	756	3,615	2,316	1,882	1,836	2,081	rp
Lough Gur	2,004	2,813	2,425	1,249	1,341	1,966	ga, sv
Cabragh Wetlands	2,145	1,993	1,883	1,931	1,716	1,934	sv
Coole Lough - Newtown Turlough	2,456	791	2,513	1,894	1,611	1,853	ws

Kilcolman Marsh	2,614	1,254	2,782	1,199	1,385	1,847	sv
Poulaphouca Reservoir	1,545	1,390	1,525	2,648	1,302	1,682	gj
Glenamaddy Turlough				1,651		1,651	ws
Lough Arrow				657*	1,578	1,578	lg
Ballyness Bay	1,652	1,832	1,202	1,448	1,579	1,543	rp, ss
Skerries Coast	1,992	1,302	817	1,713	1,071	1,379	ss
Lough Gara			1,201	1,653	1,143	1,332	ws
Loop Head Coast	1,244					1,244	tt
Stick Estuary (Oysterhaven)	1,526	555*	553*	1,194	1,000	1,240	bw
Lough Carra		586	1,774	1,244	1,261	1,216	ga
Dunfanaghy New Lake	1,853	1,290	874	1,002	849	1,174	nw, by
Blackwater Railway Lake	2,204	344	1,259	559	1,246*	1,092	t.

**Other nationally important sites (species occurring in nationally important numbers):** Brandon Bay - Inner Brandon Bay 938 (sp, cx), Lambay Island 927 (gj), Inishmore, Aran Islands 849 (rp, ss), Outer Sligo Bay 819 (by, e.), Marlfield Lake 777 (ga, sv), Bantry Bay 715 (lg), Pat Reddan's Lake 576 (ga), Streedagh Estuary 557 (e.), Lough Eorna 543 (lg), Lough Aderry 493 (ga), Skerries, Baldongan 481 (gj), Birmore Island 456 (by), River Glyde 408 (gj), Annalee River 375 (ws), Inishfree Bay 374 (ln), Cloghanhill 356 (ws), Carras Lough 267 (ws), Illaunonearaun Isl. 218 (by), Ballinskelligs Bay 162 (cx), Gravelstown 142 (ws), Mid-Waterford Coast 42 (nd).