

# Irish Wetland Bird Survey: results of waterbird monitoring in Ireland in 2010/11

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In 2010/11, 247 sites comprising 729 subsites were covered as part of the Irish Wetland Bird Survey, and this included the majority of the nationally and internationally important sites. A total of 99

waterbird species was recorded, with numbers of most species peaking in January. Wigeon *Anas penelope*, Teal *Anas crecca*, Pochard *Aythya ferina* and Coot *Fulica atra* were the most numerous wildfowl species. Oystercatcher *Haematopus ostralegus*, Golden Plover *Pluvialis apricaria*, Lapwing *Vanellus vanellus* and Dunlin *Calidris alpina* were the most numerous wader species, with Black-headed Gull *Chroicocephalus ridibundus* the most numerous gull species. Totals of 53 internationally important and 79 nationally important sites were identified, with Dundalk Bay, Wexford Harbour and Slob, Lough Foyle, Dublin Bay and Lough Swilly the top five most important sites. The trends of 42 species were measured and showed that 17 increased on average over the period between 1994/95 and 2010/11, while nine declined. Greatest increases were in Little Egret *Egretta garzetta*, Canada Goose *Branta canadensis* (feral), Barnacle Goose *Branta leucopsis* and Sanderling *Calidris alba*. Greatest declines were in Bewick's Swan *Cygnus columbianus bewickii*, Scaup *Anas marila*, Lapwing and Dunlin. An assessment of shorter-term trends for the period 2005/06 to 2010/11 showed that there have been recent increases of 25% or more in 13 species, and declines of 25% or more in Bewick's Swan, Pochard, Cormorant *Phalacrocorax carbo*, Golden Plover and Lapwing. Recent cold winters are thought to be responsible for some of these short-term changes.



## Introduction

Ireland is situated on one of the major flyways for arctic-nesting species, and is of great importance for wintering waterbirds. Extensive areas of wetland and a relatively mild climate attract more than one million waterbirds each winter. Most species which occur in Ireland migrate from the north and northwest (principally Canada, Greenland and Iceland), or from the northeast (northern Europe, Scandinavia, Russia and Siberia), moving south to winter predominantly in west and northwest Europe and west Africa (Wetlands International 2006, Wernham *et al.* 2002).

As a member of the European Union, and as a signatory to a number of international conservation conventions, Ireland is required to identify and designate important wetlands for waterbirds. As part of this process, Ireland is obliged to carry out regular monitoring of these sites. The Irish Wetland Bird Survey (I-WeBS) was initiated in the Republic of Ireland in 1994/95. This survey is ongoing, and aims to continuously monitor wintering waterbird populations and the wetlands upon which they rely. On the basis of the data collected through this survey, as well as previous wetland

**Plate 177.** Knot (John Fox).

bird surveys, including the Winter Wetland Survey (1984/85-1986/87) and the Wetlands Enquiry (1971/72-1973/74), in excess of 90 wetlands in Ireland have been designated as Special Protection Areas (SPAs) for wintering waterbirds under the EU Birds Directive (2009/147/EC).

This paper aims to present summarised results of data collated in 2010/11 on the status of wintering waterbird populations and their key wetland sites in the Republic of Ireland.

## Methods

I-WeBS uses the well-established technique of counting the numbers of waterbirds at wetland sites by the 'look-see' method (Bibby *et al.* 1992). This involves counters recording the number of individuals of each waterbird species on their pre-defined wetland sites. Counts are undertaken once per month between September and March inclusive, and on or near pre-determined dates. It is recommended that counts of coastal sites be carried out at or near high tide, and therefore dates selected for survey are on mid-month weekends with high tides as close to midday as possible. Given differences in tidal cycle regimes around Ireland, counts for south and west coast sites are scheduled one week later than those of east coast and midland sites.

Large sites usually require a team of counters to ensure that surveys are conducted over a relatively short period (within three hours) to minimise duplicate counting of birds, particularly for those species that move extensively. Participants are encouraged to try to coordinate counts of adjacent sites between which movements are likely to occur.

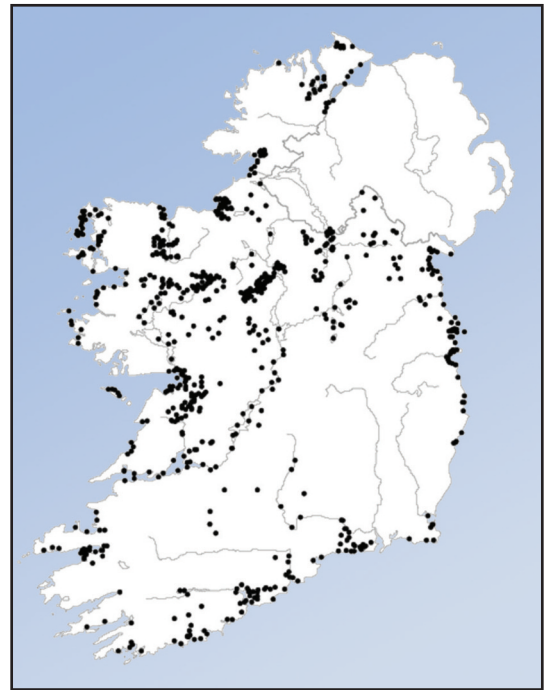
Waterbird totals are compiled, and annual peaks evaluated. The mean of peaks over the most recent five-season period available is used to examine site importance. In order to generate species trends, counts are modelled using a multiplicative log-linear index model with site, year and month as factors (Underhill & Prŷs-Jones 1994). Full details of the methods and analyses used have been described in Crowe and Boland (2004), with one exception. In addition to the standard mean annual change, a short-term trend which reflects the pattern of change between 2005/06 and 2010/11 is given. This latter statistic was based on indices modelled using generalized additive modelling. This smoothing procedure provides a robust mechanism for dampening annual fluctuations, and further details are presented in Boland and Crowe (2012).

Additional sources used in this paper include data from the January 2010 International Swan Census (Boland *et al.* 2010), the Baseline Waterbird Survey 2009-2012 (Cummins & Crowe 2010, 2011, 2012), and data provided by the UK Wetland Bird Survey. The scientific names of species mentioned in the text are listed in Appendix 1 and the footnote to Table 1.

## Results

### Coverage

In total, 247 sites comprising 729 subsites were covered in 2010/11 (Figure 1). These included 50% lakes/turloughs/reservoirs, 31% coastal sites (estuarine and open coast) and 14% rivers with the remaining including gravel pits (3 sites) marsh/ bogland (5) and grassland (1). Counts were carried out in all months between September and March. Greatest coverage (81% of sites) was in January (Table 1), while coverage in other months was lower, with between 41% and 57% of sites covered. Some 67 sites (27% of total) were covered only once, while 61% of sites were covered in at least three months and 19% were covered in all seven months. Nine sites were covered in additional months outside the core period.



**Figure 1.** Site and subsite coverage in 2010/11.

Data were received at the time of writing for almost all key sites covered in 2010/11. Exceptions included the Little Brosna Callows, Bannow Bay, Baldoyle Bay, Blackwater Callows, Seagrang Park, Portmarnock Marsh, Cashen River and Estuary, Wexford Bay, Boora Lakes - Back Lakes Finnermores, Brandon Bay - Inner Brandon Bay, River Slaney, Waterford Harbour, Skerries Islands, Lough Arrow and Smerwick Harbour.

Two aerial censuses were undertaken, on 14 December 2010 and 17 January 2011, of the Shannon and Fergus Estuary, Lough Derg, the Little Brosna Callows, Shannon Callows and the Suck Callows.

### Total waterbird numbers

Overall, 99 species were recorded (excluding feral or hybrid geese and ducks) (Table 1). Largest waterbird numbers were recorded in January (356,077 birds), comprising 43% wildfowl

(including allies), 48% waders and 9% gulls. Most species peaks were recorded during the mid-winter period (December, January and February, 48 species), although many species peaks were recorded during the autumn (September and October, 35 species). Wigeon was the most numerous wildfowl species, with Teal, Pochard and Coot also especially numerous. Dunlin, Golden Plover, Lapwing and Oystercatcher were the most numerous wader species recorded, and Black-headed Gull the most numerous of the gulls.

**Table 1.** Total numbers of waterbirds counted during I-WeBS in the Republic of Ireland in 2010/11. Note that less commonly recorded species are listed separately at the bottom of this table and are included in the subtotals given for each of the species groups.

Species	Sep	Oct	Nov	Dec	Jan	Feb	Mar
<b>Sites covered</b>	<b>102</b>	<b>117</b>	<b>141</b>	<b>118</b>	<b>201</b>	<b>136</b>	<b>106</b>
<b>Subsites covered</b>	<b>194</b>	<b>254</b>	<b>317</b>	<b>262</b>	<b>610</b>	<b>322</b>	<b>218</b>
Mute Swan	1,572	2,380	2,161	2,563	4,420	1,635	1,474
Bewick's Swan		3			38	3	16
Whooper Swan	21	1,612	2,481	1,841	3,934	2,622	1,682
Black Swan	2	3	2		3	1	3
Pink-footed Goose	2	20	37	38	4	30	17
Greenland White-fronted Goose		328	1,163	574	1,225	801	485
Greylag Goose	591	602	3,506	960	2,279	2,811	2,571
Canada Goose	260	244	81	5	120	4	6
Barnacle Goose	1	25	3,741	10	1,598	3,391	1
Light-bellied Brent Goose	1,358	6,335	10,838	9,922	11,644	9,793	8,375
Shelduck	209	658	1,874	2,539	5,206	4,385	2,432
Wigeon	2,111	20,582	16,583	25,252	42,061	16,288	7,309
Gadwall	53	136	479	268	612	377	164
Teal	2,772	6,908	11,432	8,216	18,224	10,453	6,135
Mallard	6,062	6,982	6,018	5,024	10,289	5,052	2,380
Pintail	23	284	308	424	656	575	115
Garganey	3	1					
Shoveler	188	535	1,565	823	1,123	548	328
Pochard	16	15,570	617	1,821	5,560	3,029	282
Ring-necked Duck		1	1	1	12	2	
Tufted Duck	692	2,449	4,542	8,286	13,929	4,845	2,586
Scaup	15	51	14	46	709	304	24
Long-tailed Duck		1	11	6	45	19	2
Eider	206	78	70	1	13		39
Common Scoter	350	1,163	973	3,456	2,776	882	1,125
Goldeneye	3	55	459	411	1,071	533	343
Red-breasted Merganser	180	371	617	260	738	635	630
Red-throated Diver	10	32	97	129	116	111	89
Black-throated Diver	1		8		13	41	
Great Northern Diver	1	54	195	150	525	527	70
Little Grebe	653	757	802	522	975	420	191
Great Crested Grebe	137	397	438	343	546	480	700
Slavonian Grebe	2	6	13	10	6	1	15
Cormorant	1,432	1,611	1,516	844	2,033	1,525	714
Shag	165	636	476	162	945	468	55
Little Egret	521	359	236	65	92	59	88
Grey Heron	472	470	540	206	438	170	164

Water Rail	21	10	13	18	20	10	27
Moorhen	346	423	275	141	260	154	176
Coot	1,703	15,108	6,924	7,651	17,441	4,944	1,405
<b>Total wildfowl &amp; their allies</b>	<b>22,348</b>	<b>90,641</b>	<b>81,254</b>	<b>83,195</b>	<b>152,005</b>	<b>78,279</b>	<b>42,440</b>
Oystercatcher	21,283	23,224	18,744	14,844	27,844	20,970	10,850
Ringed Plover	2,962	3,377	3,720	1,326	3,036	1,640	525
Golden Plover	888	28,652	27,397	4,798	10,957	8,224	4,767
Grey Plover	298	323	650	834	1,054	931	783
Lapwing	1,737	11,685	24,960	9,592	28,413	15,563	325
Knot	3,694	3,925	18,233	10,905	23,156	19,820	9,615
Sanderling	1,162	3,117	2,220	1,520	2,039	2,237	764
Purple Sandpiper	1		28	66	78	34	5
Dunlin	4,176	8,130	21,541	21,108	32,074	19,594	10,334
Ruff	24	20			2	1	
Jack Snipe		1			1	1	1
Snipe	72	143	303	247	298	173	33
Woodcock				2			
Black-tailed Godwit	8,420	11,238	5,022	7,462	9,130	3,773	5,803
Bar-tailed Godwit	2,549	3,498	6,247	4,873	8,246	9,251	5,103
Whimbrel	25	2	3	1		4	1
Curlew	7,960	8,300	7,460	3,430	14,228	12,335	5,953
Spotted Redshank	5	2	2			15	1
Greenshank	328	440	418	177	488	375	225
Redshank	9,137	12,309	11,159	5,055	8,680	8,411	7,199
Turnstone	988	1,568	1,815	950	2,229	2,175	1,112
<b>Total waders</b>	<b>65,762</b>	<b>119,980</b>	<b>149,927</b>	<b>87,190</b>	<b>171,954</b>	<b>125,529</b>	<b>63,399</b>
Mediterranean Gull	78	116	69	25	48	54	47
Black-headed Gull	15,488	12,832	12,488	8,082	21,126	16,042	10,259
Common Gull	5,921	5,056	4,684	1,385	6,877	6,774	2,709
Lesser Black-backed Gull	1,723	1,050	194	167	417	549	420
Herring Gull	2,934	3,173	2,630	1,374	3,661	2,689	1,162
Great Black-backed Gull	2,032	1,219	593	424	1,083	722	310
<b>Total gulls</b>	<b>23,153</b>	<b>21,076</b>	<b>20,621</b>	<b>11,335</b>	<b>32,109</b>	<b>23,044</b>	<b>14,688</b>
Sandwich Tern	540	4	4			1	2
Roseate Tern	3						
Common Tern	60		1				
Arctic Tern	10						
<b>Total terns</b>	<b>632</b>	<b>4</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>
Kingfisher	7	7	52	9	9	3	4
<b>Total waterbirds</b>	<b>111,902</b>	<b>231,708</b>	<b>251,859</b>	<b>181,729</b>	<b>356,077</b>	<b>226,856</b>	<b>120,533</b>

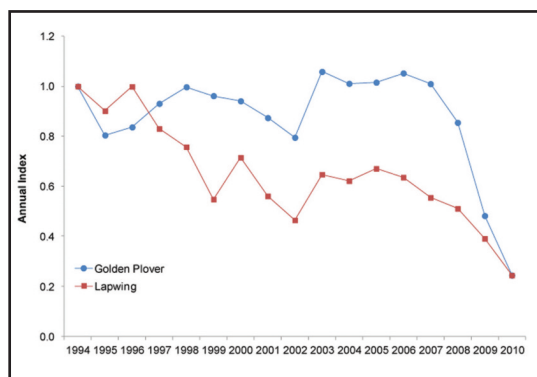
**Less commonly recorded species, together with peak count (in parentheses) and the number of months recorded:**

Bar-headed Goose *Anser indicus* (6) 1, American Wigeon *Anas americana* (1) 1, Green-winged Teal *Anas carolinensis* (2) 4, Blue-winged Teal *Anas discors* (2) 2, Surf Scoter *Melanitta perspicillata* (1) 1, Velvet Scoter *Melanitta fusca* (1) 3, Smew *Mergellus albellus* (3) 4, Goosander *Mergus merganser* (2) 6, Black-necked Grebe *Podiceps nigricollis* (1) 2, Bittern *Botaurus stellaris* (1) 2, Glossy Ibis *Plegadis falcinellus* (1) 2, Spoonbill *Platalea leucorodia* (4) 2, American Golden Plover *Pluvialis dominica* (2) 2, Little Stint *Calidris minuta* (2) 12, Pectoral Sandpiper *Calidris melanotos* (2) 2, Curlew Sandpiper *Calidris ferruginea* (2) 26, Buff-breasted Sandpiper *Tryngites subruficollis* (1) 4, Common Sandpiper *Actitis hypoleucos* (3) 10, Green Sandpiper *Tringa ochropus* (3) 3, Wood Sandpiper *Tringa glareola* (2) 1, Wilson's Phalarope *Phalaropus tricolor* (1) 1, Little Gull *Hydrocoloeus minutus* (4) 2, Ring-billed Gull *Larus delawarensis* (2) 3, Yellow-legged Gull *Larus michabellis* (1) 1, Iceland Gull *Larus glaucoideus* (3) 3, Glaucous Gull *Larus hyperboreus* (2) 3, Black Tern *Chlidonias niger* (1) 19.



## Important sites

A total of 53 internationally important and 79 nationally important sites were identified (Table 2). Of the internationally important sites, nine supported in excess of 20,000 waterbirds (excluding gulls and terns). Dundalk Bay, Wexford Harbour and Slob, Lough Foyle, Dublin Bay and Lough Swilly are the most important sites overall. Waterbird totals in 2010/11 for all of these sites, with the exception of Lough Swilly, were lowest in the five-year period, caused largely by a decline in numbers of two grassland-feeding wader species Golden Plover and Lapwing (Figure 2).



**Figure 2.** Trends in two grassland-feeding waders, Golden Plover and Lapwing, between 1994/95 and 2010/11.

Internationally and nationally important flocks were recorded for 16 and 46 species respectively during the 2010/11 season (Table 3). There was an increase in the number of internationally important concentrations of Mute Swan and nationally important concentrations of Wigeon, Shoveler, Little Grebe, Knot, Bar-tailed Godwit and Greenshank when compared with results from the previous period 2005/06-2009/10 (Crowe *et al.* 2011). There was a decline in the number of internationally important concentrations of Light-bellied Brent Goose and Whooper Swan and a consequent increase in nationally important concentrations of the latter species. There was a decline in the number of nationally important concentrations of Greenland White-fronted Goose, Pintail, Pochard, Scaup, Red-breasted Merganser, Grey Heron and Lapwing.

## Waterbird trends

The trends of 42 species were calculated for the period 1994/95-2010/11 (Table 3). Overall mean annual increases of 2% or more per year on average were recorded in 17 species, with greatest increases seen in Little Egret, Canada Goose, Barnacle Goose and Sanderling. Declines of 2% or more per year were recorded in nine species, and were greatest in Bewick's Swan, Scaup, Lapwing and Dunlin. The trends of the remaining 16 species were broadly stable.

The assessment of shorter term trends showed that there have been recent increases (2005/06-2010/11) of 25% or more in 13 species, especially Canada Goose, Gadwall, Little Egret, Moorhen and Knot. Short-term declines of 25% or more were shown in Bewick's Swan, Pochard, Cormorant, Golden Plover and Lapwing. The declines in the latter two species in 2010/11 were especially notable (Figure 2).

**Plate 178.** Golden Plover (John Fox).



**Table 2.** Total numbers of waterbirds at principal wetlands counted by I-WeBS between 2006/07 and 2010/11. Totals are derived from summed annual maxima of each species (excluding gulls and terns) across all months September to March 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, which were excluded from calculations of the means.

RH Red-throated Diver	PB Light-bellied Brent Goose	LN Long-tailed Duck	KN Knot
ND Great Northern Diver	SU Shelduck	E. Eider	SS Sanderling
LG Little Grebe	WN Wigeon	CX Common Scoter	PS Purple Sandpiper
GG Great Crested Grebe	GA Gadwall	GN Goldeneye	DN Dunlin
CA Cormorant	T. Teal	RM Red-breasted Merganser	BW Black-tailed Godwit
MS Mute Swan	MA Mallard	CO Coot	BA Bar-tailed Godwit
BS Bewick's Swan	PT Pintail	OC Oystercatcher	CU Curlew
WS Whooper Swan	SV Shoveler	RP Ringed Plover	RK Redshank
NW Greenland White-fronted Goose	PO Pochard	GP Golden Plover	GK Greenshank
GJ Greylag Goose	TU Tufted Duck	GV Grey Plover	TT Turnstone
BY Barnacle Goose	SP Scaup	L. Lapwing	LB Lesser Black-backed Gull

Site	2006/07	2007/08	2008/09	2009/10	2010/11	Mean	Species
<b>Internationally important sites supporting more than 20,000 waterbirds</b>							
Dundalk Bay	59,650	59,085	59,782	62,518	50,912	58,389	gj, PB, su, wn, t., ma, pt, cx, rm, rh, gg, ca, h., OC, rp, GP, gv, l., KN, dn, BW, BA, cu, gk, rk, tt
Wexford Harbour & Slobs		39,508*	53,125*	30,847*	26,550*	37,508*	bs, WS, NW, PB, su, wn, t., ma, pt, rm, lg, ca, mh, GP, gv, l., BW, ba
Lough Foyle ***	36,228	34,837	39,208	29,938	21,917	32,426	WS, gj, PB, su, wn, t., ma, pt, e., rm, rh, lg, gg, h., oc, gp, l., kn, ss, dn, BA, cu, gk, rk
Dublin Bay	31,575	31,427	33,933	33,634	27,931	31,700	PB, su, wn, t., pt, sv, rm, gg, ca, h., oc, rp, gv, KN, ss, dn, BW, BA, cu, gk, rk, tt
Lough Swilly	31,867	28,552	28,790	30,147	30,351	29,941	MS, WS, NW, GJ, PB, su, wn, t., ma, sv, tu, sp, gn, rm, lg, gg, h., co, oc, rp, gp, kn, dn, bw, ba, cu, gk, rk
Lough Corrib	31,279	16,650	27,423	33,575	38,071	29,400	MS, ga, sv, PO, tu, lg, mh, co, gp
Little Brosna Callows	17,942	36,803	32,390	279*		29,045	MS, ws, NW, wn, t., pt, SV, gp, l., BW
Cork Harbour	21,492*	25,125	18,475*	18,972*	13,250*	25,125	su, wn, t., ma, sv, rm, lg, gg, ca, h., mh, oc, gp, l., dn, BW, ba, cu, gk, rk, tt
Rogerstown Estuary	20,039	19,060	26,177	16,878	8,667*	20,539	gj, PB, su, t., sv, oc, rp, gp, gv, l., kn, dn, BW, cu, gk, rk, tt
<b>Other internationally important sites</b>							
Tralee Bay, Lough Gill & Akeragh Lough	29,142	16,586	10,837	17,015	20,296	18,775	MS, PB, wn, ma, sv, sp, oc, gp, l., kn, ss, bw, ba, cu, rk, tt
Tacumshin Lake	18,693	23,826	12,665	23,688	14,212	18,617	MS, ws, su, wn, ga, t., pt, sv, gp, l., bw
Bannow Bay	16,761	17,035	14,542	25,417		18,439	PB, su, oc, gp, gv, l., kn, dn, BW, ba, cu, gk, rk

Dungarvan Harbour	13,740	19,563	18,265	23,354	12,510	17,486	PB, su, oc, gp, gv, kn, dn, BW, ba, cu, gk, rk, tt
Ballymacoda	17,037	16,982		2,276**	3,268**	17,010	wn, t., sv, gp, gv, kn, ss, dn, BW, ba, cu
Inner Galway Bay	14,386	14,246	20,049	12,859	12,009	14,710	MS, PB, wn, t., sv, rm, ND, lg, ca, h., oc, rp, gv, l., dn, bw, ba, cu, gk, rk, tt
Rahasane Turlough	11,882	18,650	17,874	8,932	15,464	14,560	ws, wn, t., pt, sv, gp, l., BW
Boyne Estuary		16,324	14,786	11,188	8,928	12,807	PB, mh, oc, gp, kn, ss, dn, bw, rk
Broadmeadow (Malahide) Estuary	14,504	14,394	10,619	8,315	11,340	11,834	MS, PB, su, pt, cx, gn, rm, gg, h., oc, gp, gv, kn, bw, ba, gk, rk, tt
Lough Ree	13,270	15,319			4,915	11,168	MS, ws, wn, tu, lg, mh, co, l.
The Cull & Killag (Ballyteige)	10,438	23,871	12,661	5,593	2,739	11,060	PB, gp, l., bw, ba
Shannon & Fergus Estuary	6,990	11,069	14,698	7,860	10,560	10,235	MS, WS, su, wn, t., ca, dn, bw, cu
Inishcarra Reservoirs	13,688	10,405	11,761	10,868	2,845	9,913	MS, wn, t., ma, sv, tu, gp
Castlemaine Harbour & Rossbehy	3,583*	8,112*	7,604	6,782*	12,089	9,847	PB, su, wn, pt, cx, oc, rp, kn, ss, dn, ba, cu, gk, rk
Carlingford Lough ***	9,942	10,477	10,585	4,256	5,517	8,155	PB, su, t., sp, rm, gg, h., oc, dn, gk, rk, tt
Blacksod & Tullaghan Bays	5,467		8,686	10,020	5,439*	8,058	by, PB, cx, rm, ND, RP, kn, ss, ba, gk, tt
Clonakilty Bay		5,639	6,832	9,170	6,365	7,002	kn, dn, BW, gk
North Wicklow Coastal Marshes	4,978*	4,907	7,272	6,778	6,782	6,435	gj, PB, wn, t., sv, rh, lg, bw
Blackwater Estuary	7,762	5,733	7,324	4,638	3,802**	6,364	BW, cu, gk, rk, LB
Courtmacsherry Bay, Broadstrand Bay & Dunworley	6,329	7,362	5,654	5,089	6,720	6,231	su, wn, BW, gk
River Suck ****	3,862	6,926	2,886	11,020	6,439	6,227	MS, ws, wn
Donegal Bay	5,729	5,901	4,706	7,029	7,110	6,095	MS, PB, cx, rm, ND, lg, h., oc, ss, gk
Drumcliff Bay Estuary	3,148	6,034	4,691	7,975	7,800	5,930	BY, oc, kn, ss, ba
Baldoyle Bay	5,927	5,544	5,766	5,884		5,780	PB, su, oc, gv, bw, gk, rk
Sligo Harbour	4,050	7,470	6,008	5,315	4,146	5,398	PB, oc, kn, dn, ba, rk
Tramore Back Strand	7,412	5,054	7,619	1,640	5,025	5,350	PB, gv, bw
Lady's Island Lake	4,062	3,154	5,062	8,287	4,715	5,056	ws, PB, wn, ga, sv, bw, tt
Shannon Callows ****	1,220	3,511	5,382	6,284	8,355	4,950	MS, ws, wn, BW
Blackwater Callows				4,758		4,758	ws, wn, t., BW
Lough Derg (Shannon) ****	1,970	3,664	5,689	5,247	6,614	4,637	MS, tu, gn, co
Lough Derravaragh	5,295	4,703	3,700	3,274	4,378	4,270	MS, po, tu, lg, mh, co
Trawbreaga Bay		3,564	3,382	6,428	2,007	3,845	BY, gk
Termoncarragh & Annagh Marsh	3,411	2,774	2,848	4,801	2,452	3,257	BY, rp, ss
Lough Rea	2,970	2,828	3,217	3,765	3,268	3,210	SV, co
Lough Ennell		2,104	2,913	2,524	3,715	2,814	MS, po, tu, lg, co
Lough Iron	3,975	4,255	1,855	1,932	1,895	2,782	ws, NW, sv
Lough Oughter Complex	2,810	2,208	2,087		1,158*	2,368	MS, ws, tu, gn, gg, mh
Corofin Wetlands	295*	604*		2,462	1,555	2,009	MS, ga, sv, lg
Dundalk Bay Outer (North: Ballagan Point - Riverstown)			1,929	1,811	1,172*	1,870	PB, ca, tt
Seagrange Park	1,400					1,400	PB, bw
Eslin River		931			110*	931	MS
Dunfanaghy New Lake		690		1,219	291	733	MS, by
The Lough Cork	429					429	MS, mh
Bray Harbour	375	395	342	323	291	345	MS

**Nationally important sites supporting more than 1,000 waterbirds**

Southern Roscommon Lakes	10,933	15,083	11,047	9,987	2,349	9,880	wn, t., pt, sv, gp, l.
Cashen River & Estuary	9,548	11,369	2,029	506*		7,649	ws
Cahore Marshes	8,533*	6,159*	7,372*			7,355*	wn, pt, sv, gp, gv, bw
Kiltullagh Lough		8,542	5,834	4,752	9,072	7,050	sv, gp, l.
Nanny Estuary & shore	4,294		10,552	9,165	4,031	7,011	cx, oc, rp, kn, ss
Ballycotton Shanagarry	7,006	8,391	9,031	3,541	1,912**	6,992	t., gp, gv, ss, bw
Lough Owel	6,264	3,856	6,154	6,851	6,789	5,983	sv, po, tu, lg, gg, co
Glenamaddy Turlough		8,914	5,931	2,060	4,014	5,230	sv, gp
Wexford Bay	3,888	2,457		8,417		4,921	cx, rh
Dunany Point - Clogher Head	3,362	4,820	4,632	2,819	7,691	4,665	cx, rm, oc, kn, ss
Ballysadare Bay	2,933	5,769	3,608	5,521	4,865	4,539	rm, kn, ss, dn, ba, gk, rk
Clew Bay	3,341	3,969	4,708	4,024	5,381	4,285	by, rm, lg, ca, h., rp, ss, gk, rk
Rosscarbery	4,990			1,338	4,851	3,726	gp
Lough Sheelin	3,448	3,794	4,494	2,385	3,640	3,552	po, tu, gn, lg, gg, co
Killala Bay	4,611	2,095	4,276	1,535	4,855	3,474	gv, kn, ba
Boora Lakes - Back Lakes Finnermore			5,422	867		3,145	gp
Kildare Curragh		3,000*				3,000*	gp
Brandon Bay - Inner Brandon Bay	2,975					2,975	cx, rp, ss, gk
Hick's Tower & Robswall	1,898	2,744	3,051	3,226	3,094	2,803	oc, rp, gv, ba
Kilcolman Marsh	4,537	3,658	2,264	2,156	715	2,666	t., sv
South Mayo Coast	2,393	2,804	2,253	2,413	2,991	2,571	rp, ss
North Central Galway Lakes	3,158	2,403	1,773	2,727	1,820	2,376	ws, wn, sv
Ballyallia Lake	2,189	2,753	2,259	2,209	2,018	2,286	ga, sv, lg
Castleplunket Turloughs	4,537	1,384	2,589	1,124	1,074	2,142	sv
River Slaney		2,084				2,084	bw
Rostaff Lake	2,113	1,692	3,357	1,007	1,987	2,031	ga, sv
Lough Cullin	3,056	2,676	1,286	1,659	1,358	2,007	tu
Waterford Harbour	2,135		2,268	903		1,769	bw
Cabragh Wetlands	1,674	1,446	2,611	1,245	1,294	1,654	t., sv
Castlemaine Outer: Inch offshore					1,577	1,577	cx, rh, ss
Lough Gara	395	1,037	1,605	1,952	2,669	1,532	ws, tu
Skerries Coast		2,070	1,106		1,077	1,418	rp, tt
Skerries Islands	1,251		1,554			1,403	ca, tt
L. Coy - Blackrock - Bullaunagh - Ballylee	2,227	594	624	1,894	1,414	1,351	ws
River Erne & lakes north of Belturbet		1,313			622*	1,313	tu
Annaghmore Lakes	3,578	842	863	861	380	1,305	sv
Mid-Clare Coast (Mal Bay - Doonbeg Bay)	1,425			1,228	1,093	1,249	ss, ps, tt
Lough Foyle		2,233	1,375	738	569	1,229	gk
River Shannon (Lower) ****	709	371	1,901	1,673	1,451	1,221	tu
Lough Gur	1,779	973	800		1,304	1,214	sv
Broadhaven & Sruwadaccon Bays				1,466	866	1,166	rm
Lough Carra	1,207	1,147	1,110	981	1,315	1,152	ga, sv, gn, lg
Inishtrahull Island	1,112					1,112	by, e.
Doolough Headford (Turloughcor)	978	1,319	1,567	857	743	1,093	ga, sv
Greaghans	1,274	1,210	1,290	954	671	1,080	ws, sv
North East Galway Lakes	1,117	1,085	1,077	1,227	780	1,057	ws, sv
Lough Arrow		1,056				1,056	tu, lg



Smerwick Harbour	1,061	1,043	1,053	1,023		1,045	rp
Ringabella Creek	1,498	1,195	1,022	946	494	1,031	bw
Mullet West	804	720	997	1,583	638*	1,026	by, ln, ss

Other sites supporting nationally important numbers: River Suir Lower 935 (gj), Stick Estuary (Oysterhaven) 924 (bw), Poulaphouca Reservoir 903 (gj, mh), Glen Lough 865 (ws, sv), South East Clare Lakes 753 (lg), Omev Strand 727 (rp, ss), Dublin Zoo Ponds 688 (sv, h., mh), Charleville Lagoons 658 (sv), Ballyconneely Bay 647 (rp), Lough Eorna 646 (sv, lg), River Foyle 645 (ws), Termon Turloughs 619 (sv, lg), Clonea Strand 572 (rh), Mannin Bay 563 (rp, ss), Lough Aderry 550 (ga), An Trá Beg 520 (gk), Bantry Bay 503 (lg), Marlfield Lake 499 (ga, lg), Tymon Park 476 (mh), Pat Reddan's Lake 471 (ga, sv), Inishbofin 388 (ss), Cordara Turlough 349 (sv), Skerries, Baldongan 301 (gj), Arklow Ponds 244 (mh), River Blackwater (Meath) 207 (ws), River Moy 192 (ws), Lough Glore 176 (lg), Mullaghmore (Moylough/L. Nalarsagh) 174 (ws), Foxhall/Cloghans Hill 136 (ws), Mountseskin/Gortlum 132 (gj), Garrarus & Kilfarrassy 47 (rh).

\* Poor quality count (defined here as any of the following factors: (a) count affected by poor visibility and/ or disturbance, (b) count area partially covered, or (c) large sites covered over multiple dates).

\*\* Based on counts undertaken outside mid-winter period (November to February).

\*\*\* Data obtained from UK Wetland Bird Survey (WeBS).

\*\*\*\* Aerial census data.

## Discussion

The extent of I-WeBS coverage during the winter of 2010/11 was good, with the majority of key sites covered in three or more months. Coverage levels were comparable with other recent winters despite the inclement counting conditions. The weather during this season was documented as the coldest on record (November and December 2010), with prolonged periods of frost and snow cover, while January 2011 was somewhat milder (Met Éireann 2010a, b, 2011).

Temporal patterns of occurrence were fairly typical in 2010/11, with highest numbers of most species recorded during the mid-winter period. However, a large number of species were recorded in greatest abundance during the autumn. These included Irish-breeding species such as Little Egret, Moorhen, and the tern species where post-breeding aggregations were recorded. However, peaks in several wader species in October, especially of Golden Plover, Sanderling, Black-tailed Godwit and Redshank which usually peak later in the winter, probably reflected passage populations stopping over before moving further south. A number of scarce species were also recorded in September or October and included Blue-winged Teal, Glossy Ibis, American Golden Plover, Little Stint, Pectoral Sandpiper, Curlew Sandpiper, Buff-breasted Sandpiper, Wood Sandpiper, Wilson's Phalarope, Yellow-legged Gull and Black Tern. Pochard numbers at Lough Corrib, their stronghold site in the Republic of Ireland, were especially high in October when compared with January.

Spatial patterns of occurrence were likely to have been affected by the cold spell that persisted throughout much of Europe. During cold spells many migratory birds are known to move west from Europe into Britain and especially Ireland, which typically experiences milder winter conditions



Plate 179. Little Egret (Colm Fitzpatrick).

**Table 3.** Waterbird status in 2010/11\*, as represented by the number of internationally and nationally important concentrations and trends. See footnotes to this table and the Methods section for further details.

Species	Number of concentrations in 2010/11 (together with peak and mean for the period 2005/06-2009/10)**				Trend***	
	International		National		Mean annual change	% change 2005-2010
Mute Swan <sup>1</sup>	22	(20, 16)			1.13	0.3
Bewick's Swan			1	(2, 1)	-16.33	-69.1
Whooper Swan	4	(15, 9)	23	(13, 10)	2.36	0.1
Greenland White-fronted Goose	4	(4, 3)	1	(5, 3)	-1.68	-11.2
Greylag Goose	1	(2, 1)	8	(10, 8)	-2.04	2.2
Canada Goose					7.58	72.8
Barnacle Goose	3	(6, 3)	5	(6, 3)	7.59	-7.8
Light-bellied Brent Goose	24	(29, 27)			5.27	13.2
Shelduck			16	(16, 13)	-0.95	-11.0
Wigeon			26	(23, 21)	-1.75	-4.8
Gadwall			12	(13, 12)	5.23	77.5
Teal			21	(21, 19)	0.66	-10.3
Mallard			7	(9, 7)	-0.89	-3.2
Pintail	0	(1, 0)	11	(14, 12)	0.67	-10.9
Shoveler	2	(3, 2)	39	(32, 30)	1.58	-3.6
Pochard	1	(1, 1)	4	(8, 6)	-0.62	-46.5
Tufted Duck	0	(1, 0)	15	(15, 12)	3.79	46.0
Scaup			3	(5, 4)	-12.07	34.2
Long-tailed Duck			1	(1, 1)		
Eider			2	(2, 1)		
Common Scoter			10	(9, 7)		
Goldeneye			6	(8, 6)	-3.43	-4.6
Red-breasted Merganser			15	(18, 16)	-0.67	5.9
Red-throated Diver			7	(8, 6)		
Great Northern Diver	3	(4, 3)				
Little Grebe			24	(23, 19)	2.97	38.4
Great Crested Grebe			10	(12, 10)	-1.23	24.9
Cormorant			10	(13, 9)	0.89	-30.7
Little Egret					43.28	98.2
Grey Heron			11	(13, 12)	1.73	-4.3
Moorhen			11		4.09	72.8
Coot			9	(11, 9)	3.01	38.7
Oystercatcher	1	(1, 1)	20	(20, 16)	2.71	-4.7
Ringed Plover	1	(2, 1)	18	(20, 18)	1.96	-14.8
Golden Plover	1	(5, 3)	25	(26, 20)	-3.28	-71.1
Grey Plover			14	(15, 13)	-3.46	13.8
Lapwing			15	(20, 16)	-5.58	-59.9
Knot	2	(3, 2)	18	(17, 13)	2.56	70.5
Sanderling			23	(23, 19)	7.71	5.5
Purple Sandpiper			1	(2, 1)	5.75	41.1
Dunlin			17	(17, 15)	-5.38	-8.9
Black-tailed Godwit	15	(19, 13)	19	(14, 12)	4.52	20.6
Bar-tailed Godwit	3	(4, 3)	17	(16, 14)	0.97	35.4
Curlew			15	(17, 14)	-2.94	-23.5
Greenshank			24	(20, 18)	2.68	-4.6
Redshank	0	(1, 0)	19	(21, 18)	1.32	-13.6
Turnstone			15	(15, 13)	3.22	-15.8
Lesser Black-backed Gull	1	(2, 1)				

\* Based on the mean of peaks for 2006/07-2010/11.

\*\* The threshold values used to identify international and national concentrations are based on Crowe *et al.* (2008) (national) and Wetlands International (2012) and are presented in Appendix 1. Figures in parentheses represent the peak and mean number of concentrations during 2005/06-2009/10.

\*\*\* The mean annual change is the average rate of change over the entire period 1994/95-20010/11, while the percentage change indicates the change between the specific seasons, and is based on the smoothed indices. Further details of this trend assessment are presented in the Methods section.

<sup>1</sup> The Mute Swan population is resident, thus there is no conservation requirement to define 1% thresholds for site assessment for this species.

(Wernham *et al.* 2002). However, that numbers occurring in Ireland were enhanced in 2009/10 and 2010/11 was not strongly evident from the short-term trends. Rather, the short-term trends showed most notable declines in Bewick's Swan, Pochard, Golden Plover and Lapwing. The decline in Bewick's Swan is a continuation of an ongoing decline in Ireland as fewer birds migrate now as far west as Ireland (Boland *et al.* 2010). Pochard numbers have fluctuated widely throughout I-WeBS, and the trend is largely influenced by numbers recorded at Lough Corrib, its stronghold site in the Republic of Ireland. Wintering flocks of Golden Plover and Lapwing feed on grasslands, many of which would have been frozen over in 2010/11, thereby limiting access to, and availability of their principal food resource (invertebrates). Consequently, these flocks were probably more widely distributed than usual, and it is probable that a proportion moved further south to winter in France and Iberia. These grassland wader flocks can include many thousands of individuals, and the notable decline in total waterbird numbers shown in several of the key waterbird sites in 2010/11 was driven largely by the especially low numbers of Golden Plover, and to a lesser extent Lapwing, recorded at almost all of these sites during that season.

The list of internationally and nationally important sites was broadly consistent when compared with recent winters (Crowe *et al.* 2011). However, there were some changes in the number of internationally and nationally important sites, mostly because of a recent update in the flyway estimates. Updated flyway estimates were available for this analysis, and

while these did not change greatly for most species, the estimates and 1% thresholds were substantially increased for Light-bellied Brent Goose, Whooper Swan and Black-tailed Godwit, which resulted in a loss of internationally important sites for all of these species. The threshold for Light-bellied Brent Goose doubled to 400, and consequently resulted in the de-listing of this species at seven sites; one remained internationally important for other species, four were downgraded to nationally important status, while two sites were downgraded from the list of significant sites altogether.

There was also a change in the treatment of Mute Swan data for this analysis. Mute Swan is resident in Ireland with little known immigration or emigration. In previous reports, sites where the mean of peaks exceeded the Irish threshold were considered nationally important. However, the Irish population is recognised as discrete (Wetlands International 2012), and should be considered as such in an international context. Therefore, and consistent with the approach used elsewhere (Calbrade *et al.* 2010), any site which regularly supports numbers in excess of the Irish threshold will be treated as internationally important. This approach has thereby resulted in increased numbers of internationally important sites, with Mute Swan the only internationally important species at 12 of the 59 internationally important sites.

For several other species there were increased numbers of internationally and/or nationally important flocks in 2010/11. It is possible that for some species this increase in



**Plate 180.** Shoveler (John Fox).

sites was the result of greater dispersal of flocks during the cold spells and caused by the extent of frozen wetlands. The limited availability of non-frozen wetlands is probably the reason for the decline in Whooper Swan at several key sites which were demoted from international to national importance, although it is likely that there was a decline in numbers wintering in Ireland in 2010/11 as there was a sharp fall in the index relative to the previous season.

However, increases were shown for some species in terms of the number of important sites, and for many these are consistent with increasing trends, especially Mute Swan, Little Grebe and Knot. Among these species, the increase in Knot is most remarkable given known ongoing declines at flyway level (Wetlands International 2012). This increase may have been due to a cold weather influx from elsewhere in Europe. The increase here has been shown at several key sites, most notably Lough Swilly, Courtmacsherry Estuary, Dublin Bay and at the Nanny Estuary and shoreline.

The effects of a second consecutive extremely cold winter on waterbird numbers and distribution are reflected in the patterns of distribution presented in this paper. The results presented imply that there may have been westward movement of some species into Ireland from Britain and Europe. They also indicate that the unfavourable conditions persisting in Ireland (prolonged frosts and snow cover) rendered many key sites unsuitable for certain species, and this was most evident for those occurring in high densities, such as Golden Plover and Lapwing.

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## Appendix 1.

Scientific names of species mentioned in the text, together with national (all-Ireland) and international thresholds.

Species		1% National <sup>1</sup>	1% International <sup>2</sup>
Mute Swan	<i>Cygnus olor</i>	110	110
Bewick's Swan	<i>Cygnus columbianus</i>	20	220
Whooper Swan	<i>Cygnus cygnus</i>	130	270
Pink-footed Goose	<i>Anser brachyrhynchus</i>		3,500
Greenland White-fronted Goose	<i>Anser albifrons flavirostris</i>	110	240
Greylag Goose	<i>Anser anser</i>	50	980
Barnacle Goose	<i>Branta leucopsis</i>	90	710
Light-bellied Brent Goose <sup>3</sup>	<i>Branta bernicla hrota</i>	4,003	400
Shelduck	<i>Tadorna tadorna</i>	150	3,000
Wigeon	<i>Anas penelope</i>	820	15,000
Gadwall	<i>Anas strepera</i>	20	600
Teal	<i>Anas crecca</i>	450	5,000
Mallard	<i>Anas platyrhynchos</i>	380	20,000
Pintail	<i>Anas acuta</i>	20	600
Garganey	<i>Anas querquedula</i>		20,000
Shoveler	<i>Anas clypeata</i>	25	400
Pochard	<i>Aythya ferina</i>	380	3,000
Tufted Duck	<i>Aythya fuligula</i>	370	12,000
Scaup	<i>Aythya marila</i>	45	3,100
Eider	<i>Somateria mollissima</i>	30	14,840
Long-tailed Duck	<i>Clangula hyemalis</i>		17,250
Common Scoter	<i>Melanitta nigra</i>	230	5,500
Goldeneye	<i>Bucephala clangula</i>	95	11,500
Red-breasted Merganser	<i>Mergus serrator</i>	35	1,700
Red-throated Diver	<i>Gavia stellata</i>	20	3,000
Black-throated Diver	<i>Gavia arctica</i>		3,750
Great Northern Diver	<i>Gavia immer</i>		50
Little Grebe	<i>Tachybaptus ruficollis</i>	25	4,000
Great Crested Grebe	<i>Podiceps cristatus</i>	55	3,500
Slavonian Grebe	<i>Podiceps auritus</i>		55
Cormorant	<i>Phalacrocorax carbo</i>	140	1,200
Grey Heron	<i>Ardea cinerea</i>	30	2,700
Little Egret	<i>Egretta garzetta</i>		1,300
Moorhen	<i>Gallinula chloropus</i>		
Coot	<i>Fulica atra</i>	330	17,500
Oystercatcher	<i>Haematopus ostralegus</i>	680	8,200
Ringed Plover	<i>Charadrius hiaticula</i>	150	730
Golden Plover	<i>Pluvialis apricaria</i>	1,700	9,300
Grey Plover	<i>Pluvialis squatarola</i>	65	2,500
Lapwing	<i>Vanellus vanellus</i>	2,100	20,000
Knot	<i>Calidris canutus</i>	190	4,500
Sanderling	<i>Calidris alba</i>	65	1,200
Purple Sandpiper	<i>Calidris maritima</i>	35	710
Dunlin	<i>Calidris alpina</i>	880	13,300
Ruff	<i>Philomachus pugnax</i>		12,200
Jack Snipe	<i>Lymnocyptes minimus</i>		20,000
Snipe	<i>Gallinago gallinago</i>		20,000
Black-tailed Godwit	<i>Limosa limosa</i>	140	610
Bar-tailed Godwit	<i>Limosa lapponica</i>	160	1,200
Whimbrel	<i>Numenius phaeopus</i>		6,700
Curlew	<i>Numenius arquata</i>	550	8,400



**Appendix 1 (Continued).**

Spotted Redshank	<i>Tringa erythropus</i>		900
Redshank	<i>Tringa totanus</i>	310	3,900
Greenshank	<i>Tringa nebularia</i>	20	2,300
Turnstone	<i>Arenaria interpres</i>	120	1,400
Mediterranean Gull	<i>Larus melanocephalus</i>		770
Black-headed Gull	<i>Chroicocephalus ridibundus</i>		20,000
Common Gull	<i>Larus canus</i>		16,400
Lesser Black-backed Gull	<i>Larus fuscus</i>		5,500
Herring Gull	<i>Larus argentatus</i>		10,200
Great Black-backed Gull	<i>Larus marinus</i>		4,200

<sup>1</sup> Crowe *et al.* 2008.

<sup>2</sup> Wetlands International 2006.

<sup>3</sup> Almost 100% of this flyway population winters in Ireland. Thus, the Wetlands International (2012) estimate of 400 birds was adopted for this paper.

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