



# Irish Wetland Bird Survey: Results of Waterbird Monitoring in Ireland in 2015/16



Lapwing (Brian Burke)

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## Summary

- The Irish Wetland Bird Survey (I-WeBS) was initiated in the Republic of Ireland in the winter of 1994/95. It is the primary tool for monitoring the status of non-breeding wintering waterbirds and the importance of the wetlands upon which they rely.
- This report aims to summarise the results of the survey in 2015/16 and provides an update on the status of wintering waterbirds and their key sites.
- I-WeBS uses the look-see method where counters record the number of individuals of each waterbird species on frequent visits to their pre-defined wetland sites. Waterbirds are counted at each wetland visited. Counts are scheduled to be undertaken once per month between September and March inclusive, and on or near pre-determined dates.
- In 2015/16, 234 sites comprising 667 subsites were covered, and this included the majority of principal sites. Some 71% of sites were covered in at least three months, and greatest coverage during the season was in January when 82% of sites were surveyed.
- A total of 105 waterbird species was recorded, including 61 which are regularly occurring. The maximum number of waterbirds was recorded in January, dominated by waders (56%), followed by ducks (21%), gulls and terns (10%) and swans & geese (10%). Light-bellied Brent Goose *Branta brenicla hrota*, Wigeon *Anas penelope*, Coot *Fulica atra*, Golden Plover *Pluvialis apricaria* and Black-headed Gull *Croicocephalus ridibundus* were the most numerous of the swans & geese, ducks, wildfowl allies, waders and gulls respectively.
- Based on counts between 2011/12 and 2015/16, 36 sites supporting waterbirds in numbers of international importance, and 93 sites supporting waterbirds in numbers of national importance were identified, with Dundalk Bay, Wexford Harbour & Slobs, Lough Swilly, Dublin Bay and Cork Harbour once again the top five most important sites.
- Compared to the previous reporting period; four additional sites now support concentrations of waterbirds in numbers of international importance, while conversely one site supported numbers of national importance having previously supported numbers of international importance.
- The population trends of 43 species were measured. A total of nine species increased on average across the period between 1994/95 and 2015/16, while 11 species declined. The greatest long-term increases were for Little Egret *Egretta garzetta*, Light-bellied Brent Goose, Sanderling *Calidris alba*, Black-tailed Godwit *Limosa limosa* and Common Scoter *Melanitta nigra*. The greatest long-term declines were for Bewick's Swan *Cygnus columbianus bewickii*, Scaup *Anas marila*, Pochard *Aythya farina* and Purple Sandpiper *Calidris maritima*.
- An assessment of shorter-term trends for the period 2011/12 to 2015/16 showed greatest increases in Little Egret, Common Scoter, Greylag Goose *Anser anser*, Grey Heron *Ardea cinerea* and Little Grebe *Tachybaptus ruficollis*. Conversely, the greatest short-term declines have been shown in Barnacle Goose *Branta leucopsis*, Grey Plover *Pluvialis squatarola*, Scaup *Anas marila*, Pochard and Light-bellied Brent Goose.
- The third Non-Estuarine Coastal Waterbird Survey (NEWS-III) was carried out in December 2015 and January/February 2016, largely by volunteers from the I-WeBS counter network. A total of 2,095 km of non-estuarine coastline across Northern Ireland and the Republic of Ireland were surveyed which represents 63% of the total all-Ireland non-estuarine coastline. A total of 110,061 birds of 72 species was recorded with waders comprising nearly half of the total waterbirds recorded. Overall NEWS-III shows that non-estuarine coastal habitats continue to support a broad diversity of waterbirds, and is especially important for divers, seaducks, Cormorant, Grey Heron and several waders.

## Introduction

Ireland is situated on some of the major flyways for arctic-nesting species and is of significant 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 2012, 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 a part of this process, Ireland is obliged to carry out regular monitoring of these sites.

## Methods

### Field 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 frequent visits to their pre-defined wetland sites. Waterbirds are counted at each wetland visited. Counts are ideally 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 when the high tides are 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 counts are conducted over a relatively short period (within three hours), thus minimising 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.

### Analyses

Total waterfowl numbers at each site were calculated by summing the species peaks in each season, and a

The Irish Wetland Bird Survey (I-WeBS) was initiated in the Republic of Ireland in 1994/95. This survey is ongoing, and aims to continue to monitor wintering waterbird populations and importance of the wetlands upon which they rely. On the basis of the data collated through this survey, as well as previous wetland 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) under the EU Birds Directive (2009/147/EC) for wintering waterbirds.

This report presents summarised results of data collated in 2015/16, and on the population status of wintering waterbird and their key wetland sites in the Republic of Ireland

mean count was based on the most recent five-season period (2011/12 – 2015/16). Partial or incomplete counts were excluded from the calculation of the mean. The mean of peak counts was then used to rank wetland sites based on criteria developed by the Ramsar Convention (1971), in that a site was classified as internationally important if it regularly supported in excess of 20,000 waterbirds, or if it regularly supported internationally important numbers of waterbirds (i.e. 1% or more of the flyway population estimate of a species). A site was classified as of national importance if it regularly supported 1% or more of the all-Ireland population estimate of a species (nationally important numbers).

In order to generate species trends, the counts were modeled using a multiplicative log-linear index model with site, year and month factors (Underhill and Prys-Jones 1994). Full details on the methods and analyses used are described in Crowe and Boland (2004). In addition to the standard mean annual change overall, a short-term trend which reflects the mean annual change between 2011/12 and 2015/16 was calculated.

Additional data sources used in this paper include data from the January 2015 International Swan Census (Crowe *et al.* 2015), the NPWS Waterbird Survey Programme 2009 – 2012 (Cummins and Crowe 2010, 2011, 2012) and data provided by the UK Wetland Bird Survey.

## Results

### Coverage

In total, 234 sites comprising 667 subsites were covered in 2015/16 (Fig. 1). Nearly half of the sites (45%) were lakes, while a third were coastal in nature (estuaries, non-estuarine coast and lagoons). The remaining sites were made up of rivers & canals (22 sites), turloughs (17 sites), reservoirs (2 sites), quarry/gravel pits (3 sites), bog/marsh (5 sites) and grassland (3 sites), with seven sites of unknown habitat type.

Greatest coverage (82% of sites) was in January (Table 1), with good coverage overall occurring between the months of December 2015 and March 2016.

Table 1. Number of sites and subsites covered each month and overall in 2015/16

	Sites	Subsites
Sep	104	268
Oct	128	312
Nov	130	347
Dec	141	383
Jan	192	509
Feb	149	355
Mar	145	383
<b>Covered overall</b>	<b>234</b>	<b>667</b>

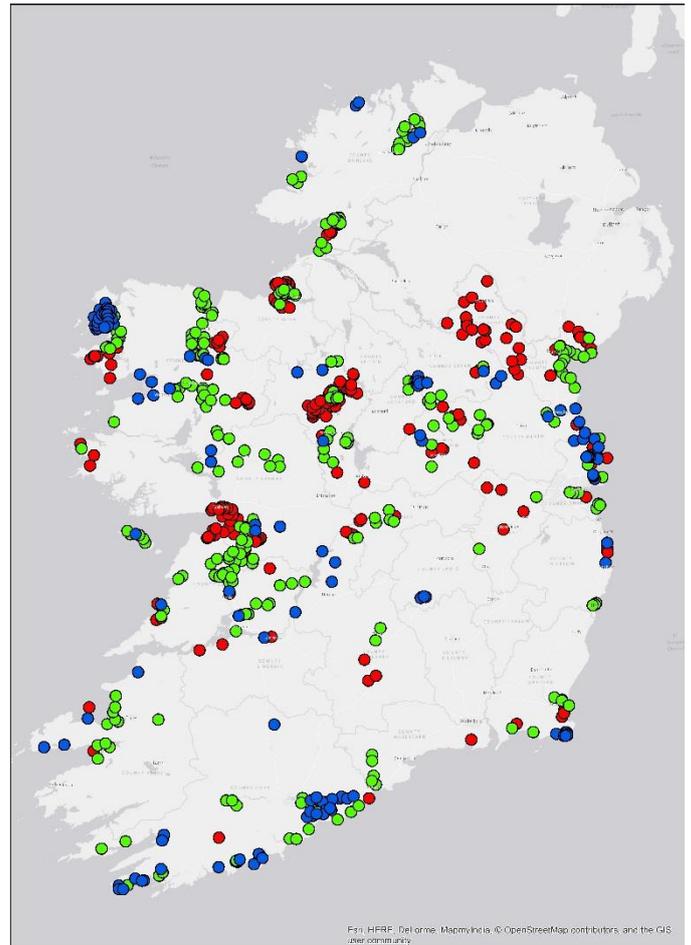


Figure 1. Subsites covered during 2015/16, illustrating the frequency of coverage: red = covered on at most two occasions during the season, green = 3-6 occasions, blue = 7 or more occasions.



Black-tailed Godwit (Michael Finn)

Some 57 sites (25% of total) were covered in all seven months, and 71% of sites were covered in three or more months overall. 29% of sites were covered only once or twice.

Data were received for most sites that support waterbirds in numbers of national and international importance. No data were received at the time of writing for Brandon Bay, Dungarvan Harbour, Broadhaven & Sruwadacon Bays, Trawbreaga Bay and others as shown in Table 2. Unfavourable conditions meant that no aerial surveys took place during the 2015/16 season. Full details of coverage at SPA sites is given in Table 2 below.

Table 2. Coverage of SPA sites in 2015/16, indicating the total number of counts achieved compared to the minimum required number of counts per site.

SPA Code	Sitename	Number counts	Counts required
4009	Lady's Island Lake	7	2
4013	Drumcliff Bay Estuary	2	2
4014	Rockabill	0	-
4015	Rogerstown Estuary	8	3
4016	Baldoyle Bay	6	2
4019	Wexford Bay	0	3
4020	The Cull & Killag (Ballyteige)	4	3
4022	Ballycotton Shanagarry	6	2
4023	Ballymacoda	1	4
4024	Dublin Bay	8	4
4025	Broadmeadow (Malahide) Estuary	6	3
4026	Dundalk Bay	4	4
4027	Tramore Back Strand	1	2
4028	Blackwater Estuary	6	3
4029	Castlemaine Harbour & Rossbehy	6	3
4030	Cork Harbour	7	4
4031	Inner Galway Bay	2	3
4032	Dungarvan Harbour	0	4
4033	Bannow Bay	3	3
4034	Trawbreaga Bay	0	2
4035	Sligo Harbour	3	2
4036	Killala Bay	5	2
4037	Blacksod & Tullaghan Bays	6	3
4037	Broadhaven & Sruwadaccon Bays	0	3
4038	Lough Leane & Killarney Valley	6	-
4041	Ballyallia Lake	7	-
4042	Lough Corrib	7	4
4043	Lough Derravaragh	4	2
4044	Lough Ennell	4	2
4045	Glen Lough	2	-
4046	Lough Iron	6	2
4047	Lough Owel	4	-
4048	Lough Gara	7	-
4049	Lough Oughter Complex	0	2
4050	Lough Arrow	0	-
4052	Carrowmore Lake	0	-
4056	Lough Cutra - Ballynakill L.	3	-
4058	Lough Derg (Shannon)	7	-
4061	Lough Kinale & Derragh Lough	6	-

SPA Code	Sitename	Number counts	Counts required
4062	Lough Mask	0	-
4063	Poulaphouca Reservoir	0	-
4064	Lough Ree	4	3
4065	Lough Sheelin	3	-
4069	Lambay Island	2	-
4075	Lough Swilly	7	4
4076	Wexford Harbour & Slobs	5	4
4077	Shannon & Fergus Estuary	7	-
4078	Carlingford Lough (RoI)	1	3
4080	Boyne Estuary	7	3
4081	Clonakilty Bay	7	3
4086	Little Brosna Callows	4	4
4087	Lough Foyle	0	-
4089	Rahasane Turlough	6	3
4090	Sheskinmore Lough	6	-
4091	Braganstown	2	-
4092	Tacumshin Lake	7	4
4093	Termoncarragh & Annagh Marsh	0	-
4094	Blackwater Callows	0	2
4095	Kilcolman Marsh	7	-
4096	Shannon Callows	4	-
4097	River Suck	5	-
4107	Coole Lough - Newtown Turlough	6	-
4109	Inishcarra Reservoirs	4	3
4122	Skerries Islands	3	-
4129	Ballysadare Bay	2	2
4134	Lough Rea	7	2
4140	Southern Roscommon Lakes	6	-
4151	Donegal Bay	3	3
4158	Nanny Estuary & shore	7	3
4182	Mid-Clare Coast (Mal Bay - Doonbeg Bay)	4	-
4186	North Wicklow Coastal Marshes	7	3
4188	Tralee Bay, Lough Gill & Akeragh Lough	7	4
4194	Dunfanaghy New Lake	7	-
4212	South Mayo Coast	5	-
4219	Courtmacsherry Bay, Broadstrand Bay & Dunworley	7	3
4220	Corofin Wetlands	7	2
4228	Lough Cullin	7	-
4228	Lough Conn	3	-

## Total waterbird numbers

Overall, 105 waterbird species were recorded in 2015/16, including 55 wildfowl and allies, 31 waders, 11 gulls, seven terns and Kingfisher. The maximum number of waterbirds was recorded in January at 299,004 waterbirds (Table 3a). Numbers of wildfowl and allies peaked in January (101,889), as did the numbers of waders (167,123). In contrast the total number of gulls and terns peaked in the month of September (Table 3a).

A total of 61 regularly occurring species were recorded in 2015/16 (Table 3a). Regularly occurring species are defined as those recorded during the priority I-WeBS period (Sep – Mar), in at least seven of the last 10 years and at more than 10 sites on average over that period. A further 41 scarce species (i.e. not meeting the criteria of ‘regularly occurring’ species) were also recorded during 2015/16 (Table 3b), plus another seven species that are from introduced or released origins (Black Swan *Cygnus atratus*, Canada Goose *Branta canadensis*, Egyptian Goose *Alopochen aegyptiacus*, Bar-headed Goose *Anser indicus*,

Mandarin *Aix galericulata*, feral/ hybrid goose, and feral/ hybrid Mallard).

As a group, waders dominated in terms of numbers in all months, with numbers representing between 45% (February) and 56% (January) throughout the count period (Table 4). Wildfowl and their allies comprised between 23% and 43% of total waterbirds, while gulls and terns comprised between 9% and 28% (Table 4).

Amongst the waders, Golden Plover, Lapwing, Dunlin and Oystercatcher were the most numerous (Table 3a), with the total numbers of Golden Plover exceeding 36,000 in March 2016. Wigeon was the most abundant wildfowl species recorded (>26,000 individuals in November 2015), while Black-headed Gull was by far the most numerous of the gull species.



Golden Plover (Brian Burke)

Table 3a. Total numbers counted of regularly occurring waterbirds between September 2015 and March 2016.

Species		Sep	Oct	Nov	Dec	Jan	Feb	Mar
Mute Swan	<i>Cygnus olor</i>	2,335	2,249	2,698	1,787	2,366	1,707	2,097
Whooper Swan	<i>Cygnus cygnus</i>	12	71	1,777	1,896	2,735	2,310	1,991
Pink-footed Goose	<i>Anser brachyrhynchus</i>			46	12	7	4	139
Greenland White-fronted Goose	<i>Anser albifrons flavirostris</i>			5,474	6,267	6,815	8,073	7,582
Greylag Goose	<i>Anser anser</i>	607	108	1,962	476	2,767	2,292	1,647
Barnacle Goose	<i>Branta leucopsis</i>		55	1,191	801	910	32	961
Light-bellied Brent Goose	<i>Branta bernicla hrota</i>	183	2,140	10,270	5,271	12,684	12,569	12,075
Shelduck	<i>Tadorna tadorna</i>	172	352	2,281	1,697	4,283	2,945	3,256
Wigeon	<i>Anas penelope</i>	1,968	11,977	26,284	21,882	23,664	13,062	9,816
Gadwall	<i>Anas strepera</i>	156	276	204	140	235	82	166
Teal	<i>Anas crecca</i>	4,221	6,360	12,717	11,674	12,300	7,848	6,461
Mallard	<i>Anas platyrhynchos</i>	6,754	5,966	6,542	4,063	5,867	2,335	2,296
Pintail	<i>Anas acuta</i>	47	204	344	266	219	154	1,369
Shoveler	<i>Anas clypeata</i>	109	330	866	1,194	938	646	731
Pochard	<i>Aythya ferina</i>	21	98	16	97	556	1,624	186
Tufted Duck	<i>Aythya fuligula</i>	936	1,691	2,412	3,228	4,768	3,598	2,716
Scaup	<i>Aythya marila</i>	27	10	40	37	4	30	21
Long-tailed Duck	<i>Clangula hyemalis</i>		2	22	9	32	21	12
Common Scoter	<i>Melanitta nigra</i>	2,143	3,689	4,265	2,840	9,004	11,270	5,966
Goldeneye	<i>Bucephala clangula</i>	2	18	279	206	428	312	220
Red-breasted Merganser	<i>Mergus serrator</i>	135	401	529	317	1,063	645	741
Red-throated Diver	<i>Gavia stellata</i>	11	71	68	199	169	112	131
Great Northern Diver	<i>Gavia immer</i>	30	336	144	339	701	723	569
Little Grebe	<i>Tachybaptus ruficollis</i>	816	671	638	410	516	345	265
Great Crested Grebe	<i>Podiceps cristatus</i>	246	291	505	240	772	374	415
Cormorant	<i>Phalacrocorax carbo</i>	1,803	1,678	1,639	1,007	2,280	1,321	1,398
Shag	<i>Phalacrocorax aristotelis</i>	209	352	328	595	553	451	154
Little Egret	<i>Egretta garzetta</i>	718	626	243	163	312	261	418
Grey Heron	<i>Ardea cinerea</i>	576	515	379	218	490	221	288
Water Rail	<i>Rallus aquaticus</i>	10	12	8	12	12	22	8
Moorhen	<i>Gallinula chloropus</i>	234	257	204	170	191	233	245
Coot	<i>Fulica atra</i>	3,176	4,997	4,311	4,761	4,000	2,402	1,119
<b>Total wildfowl &amp; allies*</b>		<b>28,242</b>	<b>45,976</b>	<b>89,004</b>	<b>72,457</b>	<b>101,889</b>	<b>78,251</b>	<b>65,626</b>
Oystercatcher	<i>Haematopus ostralegus</i>	14,944	13,492	17,662	8,251	20,997	11,089	11,328
Ringed Plover	<i>Charadrius hiaticula</i>	2,251	2,073	2,054	1,283	2,270	586	589
Golden Plover	<i>Pluvialis apricaria</i>	1,185	6,675	34,905	27,239	32,049	15,370	36,364
Grey Plover	<i>Pluvialis squatarola</i>	366	82	565	153	705	440	1,186
Lapwing	<i>Vanellus vanellus</i>	3,282	3,689	18,846	25,321	29,993	10,527	1,402
Knot	<i>Calidris canutus</i>	2,166	1,710	9,040	2,909	6,354	3,048	2,966
Sanderling	<i>Calidris alba</i>	781	2,231	759	1,382	2,718	789	860
Purple Sandpiper	<i>Calidris maritima</i>	4	4	73	111	24	29	16
Dunlin	<i>Calidris alpina</i>	4,324	4,298	8,111	9,727	25,007	11,907	7,983
Ruff	<i>Philomachus pugnax</i>	93	14	12	9		7	10
Snipe	<i>Gallinago gallinago</i>	39	83	205	268	322	177	98
Black-tailed Godwit	<i>Limosa limosa</i>	9,493	10,290	9,460	4,752	14,778	7,613	9,417

Bar-tailed Godwit	<i>Limosa lapponica</i>	1,937	2,301	4,307	2,676	6,589	3,258	4,720
Whimbrel	<i>Numenius phaeopus</i>	104	6	3	4	3	12	2
Curlew	<i>Numenius arquata</i>	8,020	6,119	7,191	7,117	13,445	9,880	4,470
Common Sandpiper	<i>Actitis hypoleucos</i>	7	3	1	1		2	2
Greenshank	<i>Tringa nebularia</i>	612	587	405	304	499	329	385
Redshank	<i>Tringa totanus</i>	10,101	7,548	7,170	5,445	9,341	5,596	8,802
Turnstone	<i>Arenaria interpres</i>	1,135	1,137	1,323	1,157	2,024	951	992
<b>Total waders*</b>		<b>60,856</b>	<b>62,351</b>	<b>122,700</b>	<b>98,113</b>	<b>167,123</b>	<b>81,614</b>	<b>91,594</b>
Mediterranean Gull	<i>Larus melanocephalus</i>	122	128	15	111	26	18	76
Black-headed Gull	<i>Chroicocephalus ridibundus</i>	18,717	12,179	9,160	11,009	16,574	10,960	14,833
Common Gull	<i>Larus canus</i>	3,502	2,392	3,524	3,064	6,208	2,836	2,878
Lesser Black-backed Gull	<i>Larus fuscus</i>	4,259	2,410	1,080	649	1,698	1,483	1,790
Herring Gull	<i>Larus argentatus</i>	5,375	3,905	4,393	2,445	4,475	4,193	3,318
Iceland Gull	<i>Larus glaucoides</i>			1	1	4	1	3
Glaucous Gull	<i>Larus hyperboreus</i>	1		1		1		2
Great Black-backed Gull	<i>Larus marinus</i>	1,839	1,017	1,636	978	985	1,302	615
Sandwich Tern	<i>Sterna sandvicensis</i>	584	72			4		76
<b>Total gulls and terns*</b>		<b>35,193</b>	<b>22,104</b>	<b>20,208</b>	<b>18,641</b>	<b>29,978</b>	<b>20,796</b>	<b>23,518</b>
Kingfisher	<i>Alcedo atthis</i>	18	15	8	9	14	7	4
<b>Total Waterbirds*</b>		<b>124,309</b>	<b>130,446</b>	<b>231,920</b>	<b>189,220</b>	<b>299,004</b>	<b>180,668</b>	<b>180,742</b>

\* Totals include records of other waterbirds, including vagrant species listed in Table 3b, feral or naturalized geese and ducks, as well as others that were not identified to species level (e.g. those submitted as unidentified waders)

Table 3b. Scarce species in 2015/ 16. The peak monthly count is indicated in brackets.

Bewick's Swan <i>Cygnus columbianus</i> (17)	Spoonbill <i>Platalea leucorodia</i> (1)
Black Swan <i>Cygnus atratus</i> (4)	Avocet <i>Recurvirostra avosetta</i> (1)
Bar-headed Goose <i>Anser indicus</i> (1)	Dotterell <i>Charadrius morinellus</i> (1)
Black Brant <i>Branta bernicla nigricans</i> (1)	American Golden Plover <i>Pluvialis dominica</i> (1)
Egyptian Goose <i>Alopochen aegyptiacus</i> (1)	Little Stint <i>Calidris minuta</i> (2)
Ruddy Shelduck <i>Tadorna ferruginea</i> (1)	Curlew Sandpiper <i>Calidris ferruginea</i> (3)
Mandarin Duck <i>Aix galericulata</i> (4)	Buff-breasted Sandpiper <i>Tryngites subruficollis</i> (1)
American Wigeon <i>Anas americana</i> (1)	Jack Snipe <i>Lymnocyptes minimus</i> (2)
Green-winged Teal <i>Anas carolinensis</i> (1)	Woodcock <i>Scolopax rusticola</i> (1)
Garganey <i>Anas querquedula</i> (2)	Green Sandpiper <i>Tringa ochropus</i> (2)
Ring-necked Duck <i>Aythya collaris</i> (1)	Spotted Redshank <i>Tringa erythropus</i> (7)
Eider <i>Somateria mollissima</i> (15)	Wood Sandpiper <i>Tringa glareola</i> (2)
Surf Scoter <i>Melanitta perspicillata</i> (1)	Little Gull <i>Larus minutus</i> (3)
Velvet Scoter <i>Melanitta fusca</i> (2)	Ring-billed Gull <i>Larus delawarensis</i> (3)
Smew <i>Mergellus albellus</i> (1)	Yellow-legged Gull <i>Larus michahellis</i> (2)
Goosander <i>Mergus merganser</i> (6)	Roseate Tern <i>Sterna dougallii</i> (6)
Black-throated Diver <i>Gavia arctica</i> (7)	Common Tern <i>Sterna hirundo</i> (364)
Red-necked Grebe <i>Podiceps grisegena</i> (3)	Forster's Tern <i>Sterna forsteri</i> (1)
Slavonian Grebe <i>Podiceps auritus</i> (105)	Little Tern <i>Sterna albifrons</i> (6)
Great White Egret <i>Ardea alba</i> (1)	Black Tern <i>Chidonias niger</i> (1)
Glossy Ibis <i>Plegadis falcinellus</i> (20)	

Table 4. Proportion of the total numbers represented by the three main groups of waterbirds.

Group	Sep	Oct	Nov	Dec	Jan	Feb	Mar
	%	%	%	%	%	%	%
Waders	49	48	53	52	56	45	51
Wildfowl and allies	23	35	38	38	34	43	36
Gulls and terns	28	17	9	10	10	12	13

## Principal sites

Based on counts between 2011/12 and 2015/16, 36 sites were identified to support waterbirds in numbers of international importance; an increase on the 33 sites identified in the previous period (2010/11 – 2014/15) (Lewis et al. 2016) (Table 5).

Sites with a five-year average of 20,000+ waterbirds were Dundalk Bay, Wexford Harbour & Slobs, Lough Swilly, Dublin Bay, and Cork Harbour (Table 5). Lough Foyle is monitored by UK WeBS and continues to support numbers in excess of this threshold; Frost et al. (2017) reported a mean of 31,488 for the period 2011/12 to 2015/16. In addition, Little Brosna Callows, Rogerstown Estuary, Tralee Bay (& Lough Gill & Akeragh Lough), Shannon Callows (Aerial) and Boyne Estuary all supported peak numbers of waterbirds (excluding gulls and terns) in excess of 20,000 during the five-year period examined, with means ranging from 13,000 to 19,000 (Table 5).

Compared to the previous reporting period, four sites supported concentrations of waterbirds in numbers of international importance, having supported numbers of national importance previously, namely:

- Shannon and Fergus Estuary Aerial (now internationally important for Whooper Swan)
- The Cull & Killag (Ballyteige) (Light-bellied Brent Geese)
- Blackwater Estuary (Black-tailed Godwit)
- Dunfanaghy New Lake (Barnacle Goose)

Three sites observed an increase in total numbers greater than 10% when compared with the respective previously published mean (Lewis et al. 2016) – Broadmeadow (Malahide) Estuary (+23%) Tralee Bay, Lough Gill & Akeragh Lough (+11%) and Drumcliff Bay Estuary (+10%).

In contrast, declines of more than 10% in overall waterbird numbers were recorded at Tramore Back Strand (-15%), Rogerstown Estuary (-14%) and Shannon Callows (aerial) (-14%) since the last publication.

Based on the mean of peak counts between 2011/12 and 2015/16, 93 sites were identified as supporting waterbirds in numbers of national importance; the same number of sites as during the previous reporting period (2010/11 – 2014/15) (Lewis et al. 2016) (Table 6).

Two sites supported concentrations of waterbirds in numbers of national importance, having supported numbers of international importance previously, namely:

- Lough Corrib (previously of international importance for Pochard)

- Shannon & Fergus Estuary (Black-tailed Godwit)



Sanderling (John Fox)

Twelve sites supported nationally important concentrations of waterbirds for this period that were not listed during the former period; namely: Derrycourt West, Kildare Curragh, Boora Lakes-Back Lakes Flnnamores, Carlingford Lough (ROI), Achill Island, Lambay Island, Annaghmore Lakes, Ireland's Eye, Dunfanaghy Estuary, Knock Lake, Magharees Islands and Grand Canal (Dublin) (Table 6).

In contrast, nine sites that supported nationally important concentrations of waterbirds during the former period do not qualify for this listing during the current period.

Seven sites observed an increase in numbers in excess of 20% when compared with the respective means presented in Lewis *et al.* (2016): Castleplunket Turloughs, Mid-Clare Coast (Mal Bay – Doonbeg Bay), Lough Oughter Complex, North Central Galway Lakes, Lough Gowna and Dundalk Bay Outer (North: Ballagan Point – Giles Quay). In contrast, there were substantial declines, in excess of 20% when compared with the respective means presented in Lewis *et al.* (2016), at six sites: Buckrone Fen, Castlemaine Outer: Inch Offshore, Lough Derg (Shannon), South Mayo Coast, Lough Sheelin and Kilglassan Turlough/Greaghans.

Table 5. Sites supporting internationally important numbers of waterbirds based on counts between 2011/12 and 2015/16.

Site	2011/12	2012/13	2013/14	2014/15	2015/16	Mean	Species occurring in significant numbers*
<b>Sites supporting more than 20,000 waterbirds</b>							
Dundalk Bay	50,642	46,921	49,477	37,617	39,595	44,850	gj, PB, su, t., ma, pt, cx, rm, nd, ca, et, h., oc, rp, gp, gv, l., KN, dn, BW, BA, cu, rk, tt
Wexford Harbour & Slobs	47,245	27,112	37,041	32,736	31,533	35,133	ms, WS, NW, PB, su, wn, t., ma, pt, rm, lg, gg, ca, et, oc, gp, gv, l., ss, dn, BW, ba, cu, gk, rk
Lough Swilly	33,677	28,175	28,507	36,623	32,748	31,946	ms, WS, NW, GJ, PB, su, wn, t., ma, sv, tu, gn, rm, rh, nd, lg, gg, ca, h., co, oc, rp, gp, l., kn, ss, dn, BW, ba, cu, gk, rk
Dublin Bay	26,802	27,443	31,427	31,595	27,601	28,974	PB, su, wn, t., pt, sv, rm, gg, et, h., oc, rp, gv, kn, ss, dn, BW, BA, cu, gk, rk, tt
Cork Harbour	26,072	28,611	20,050	25,066	19,850	23,930	su, wn, ga, t., ma, rm, lg, gg, ca, et, h., oc, gp, l., dn, BW, ba, cu, gk, rk, tt
<b>Other internationally important sites</b>							
Little Brosna Callows	20,962	12,011	15,613	25,770	9,716*	18,589	ms, ws, nw, wn, t., pt, sv, gp, gv, l., BW
Rogerstown Estuary	16,784	21,768	11,374	15,976	21,367	17,454	gj, PB, su, wn, t., rm, lg, et, oc, rp, gp, gv, l., ss, ps, dn, bw, cu, gk, rk, tt
Tralee Bay, Lough Gill & Akeragh Lough	21,029	23,898	8,866	8,638	10,377	14,562	ms, PB, wn, pt, sp, oc, rp, gp, gv, l., ss, dn, bw, ba, cu, gk, rk, tt
Ballymacoda	17,675	8,987		16,088	2,266*	14,250	PB, t., et, rp, gp, gv, l., ss, dn, BW, ba, cu, tt
Shannon Callows (Aerial)	20,652	7,591				14,122	ms, WS, wn, t., gp, l.
Inner Galway Bay	18,710	11,663	14,305	12,491	10,206	13,475	PB, wn, t., sv, rm, ND, lg, gg, ca, et, h., rp, gv, l., dn, bw, ba, cu, gk, rk, tt
Dungarvan Harbour	8,880	12,444	16,378	15,624		13,332	PB, su, rm, gg, oc, gp, gv, l., kn, dn, BW, ba, cu, rk, tt
Boyne Estuary	23,045	15,159	8,179	8,206	11,563	13,230	PB, su, t., oc, gp, gv, l., kn, ss, dn, bw, rk
Shannon & Fergus Estuary Aerial (+1)	12,172	12,759				12,466	WS, su, wn, t., gp, gv, l., dn
Rahasane Turlough	14,150	5,798	16,254	11,522	11,741	11,893	wn, ma, pt, sv, et, gp, l., BW
Bannow Bay	9,204		12,618	12,445	7,705	10,493	PB, su, gp, gv, l., dn, bw, ba, cu
Castlemaine Harbour & Rossbehy	11,648	10,735	9,347	11,114	8,999	10,369	PB, wn, ma, pt, cx, et, rp, gv, ss, dn, ba, cu, gk, rk
Blacksod & Tullaghan Bays	9,739	10,646	12,840	8,305	7,247	9,755	gj, by, PB, cx, rm, rh, ND, rp, gv, ss, dn, ba, cu, gk, tt
The Cull & Killag (Ballyteige) (+1)	3,939	4,391	6,569	11,895	8,701	7,099	PB, t., gp, gv, l., bw, ba, rk
Tramore Back Strand	3,120	6,024	7,444	8,821		6,352	PB, ga, lg, gv, bw, cu
Donegal Bay	5,607	6,647	5,764	5,778	5,340	5,827	ms, WS, pb, cx, rm, rh, ND, lg, h., oc, rp, ss, cu, gk, tt
Clonakilty Bay	6,220	4,064	5,962	6,103	6,253	5,720	wn, ma, rp, dn, BW, gk, rk
Blackwater Estuary (+1)	5,248	4,973	5,632	3,529	8,896	5,656	su, t., et, h., BW, cu, gk, rk
Broadmeadow (Malahide) Estuary	3,466	9,488	5,369	4,100	4,545	5,394	PB, su, ga, rm, lg, gg, oc, gv, bw, gk, tt
Courtmacsherry Bay, Broadstrand Bay & Dunworley	6,025	5,520	5,487	4,617	5,219	5,374	su, wn, t., nd, et, BW, cu
Killala Bay	4,634	8,417	3,791	5,627	3,198	5,133	PB, rm, gv, kn, dn, ba, cu
Baldoyle Bay			6,459	3,994	4,095	4,849	PB, rh, gg, gp, gv, bw
North Wicklow Coastal Marshes	5,275	3,123*	4,846	2,655*	4,106	4,742	gj, PB, wn, t., sv, rh, lg, et, bw
Drumcliff Bay Estuary	6,614	4,260	3,557	4,933	3,851	4,643	BY, su, rm, kn, ss, ba
Ballysadare Bay	4,694	3,575	4,715	5,039	4,734	4,551	PB, t., rm, ss, ba, cu, gk, rk
Sligo Harbour	2,795	6,673	4,303	4,398	3,974	4,429	PB, e., cx, rm, oc, rp, ss, ba, cu, rk
Hick's Tower & Robswall	2,977					2,977	PB, oc, gv
Termoncarragh & Annagh Marsh	2,191	2,766	2,943	2,177		2,519	gj, BY, rp, ss
Lough Iron	3,428	1,690	1,898	1,926	2,820	2,352	NW, sv
Lough Gara	1,901	1,831	1,821	2,544	491*	2,024	ms, WS, tu
Dunfanaghy New Lake (+1)			1,615	1,519	1,600	1,578	ms, BY

\*Species code in upper case = occurring in numbers of international importance; Species code in lower case = occurring in numbers of national importance

Table 6. Sites supporting nationally important numbers of waterbirds based on counts between 2011/12 and 2015/16.

Site	2011/12	2012/13	2013/14	2014/15	2015/16	Mean	Species occurring in significant numbers
Tacumshin Lake	19,499	11,827	10,170	10,282	14,154	13,186	ms, gj, su, wn, ga, t., pt, sv, lg, et, co, gp, l., dn, bw
Lough Corrib	11,012	8,101	12,481	14,279	774	9,329	ms, gj, po, tu, lg, co, gp
Southern Roscommon Lakes	14,157	8,244	9,446	9,658	2,657	8,832	wn, t., pt, sv, gp, l.
Inishcarra Reservoirs	3,275	13,942	9,636	1,411*	6,730	8,396	gj, wn, t., ma, gp, gv, l.
Little Brosna Callows (aerial)	6,516	6,924				6,720	ms, nw, wn
River Suck (Aerial)	6,026	7,118				6,572	ms, wn, t., l.
Boora Lakes - Back Lakes Finnamores (+1)			942*		5,709	5,709	gp, l.
Ballycotton Shanagarry	3,654	5,263	6,158	6,218	5,993	5,457	t., gp, gv, ss, cu
Cashen River & Estuary	6,542		2,837*	3,400	5,647	5,196	l., ss, bw, ba
Lady's Island Lake	4,324	8,443	3,604	2,909	2,986	4,453	ms, gj, wn, ga, et, bw
Derryoughter West (+1)					4,196	4,196	gp
Rosscarbery	4,712	3,196	5,405	3,881	3,340	4,107	gp
Lough Derg (Shannon) Aerial	3,724	4,429				4,077	ms, gj, t., tu, gn, co
Glenamaddy Turlough		195	7,716			3,956	gp
Clew Bay	4,295	5,027	3,174	3,181	3,700	3,875	by, rm, nd, lg, ca, h., rp, ss, cu, gk, tt
Dunany Point - Clogher Head	4,053	2,994	1,128*		4,010	3,686	rm, kn, ss
Lough Owel	3,572	4,469	4,284	4,142	1,903	3,674	sv, po, tu, co
Lough Rea	3,125	3,456	3,679	3,905	4,018	3,637	sv, po, co
Shannon Callows	4,588	2,716		5,305	1,470	3,520	ms, wn, pt, gp
Kildare Curragh (+1)					3,500	3,500	gp
Lough Ennell	3,891	1,964	4,838	2,351	3,428	3,294	ms, po, tu, lg, co, gv
River Deel		3,092				3,092	l.
Nanny Estuary & shore	3,881*	3,407*	3,167	1,823	3,780	2,923	cx, rp, kn, ss, bw
Shannon & Fergus Estuary	2,372	3,822	2,101	3,190	757*	2,871	gj, ga, sv, rm, nd, lg
Brandon Bay - Inner Brandon Bay	4,129	2,542	1,833			2,835	cx, ss
Lough Derg (Shannon)	4,444		3,497	2,244	983	2,792	ms, tu, lg, gg, ca, co
North Central Galway Lakes	2,332	2,977	1,567		4,251	2,782	ws, wn, sv
Lough Derravaragh	1,916	3,284	2,983	2,558	1,270	2,402	po, tu, lg, co
River Slaney		2,216	825*			2,216	t.
Ballyallia Lake	1,978	2,013	2,402	2,639	2,024	2,211	wn, ga, t., pt, sv, lg
Lough Kinale & Derragh Lough			1,610	2,153	2,410	2,058	ms, tu, lg, co, gv
Lough Cullin	2,666	1,846	1,640	2,667	1,367	2,037	ms, tu
Lough Oughter Complex	1,870	2,081	2,075	666*		2,009	ms, ws, tu
Dundalk Bay Outer (North: Ballagan Point - Giles Quay)	1,475	2,671	1,402		2,171	1,930	rm, ca
Skerries Islands			2,295		1,496	1,896	ca, cu, tt
Mid-Clare Coast (Mal Bay - Doonbeg Bay)	922	1,753	569*	1,113	3,759	1,887	rp, ss, ps, tt
Carlingford Lough (Rol) (+1)	885				2,817	1,851	rm, rh, dn
Poulaphouca Reservoir	2,126	1,333				1,730	gj, t., ma
Skerries Coast	1,777	1,931	1,350	1,721	1,825	1,721	rp, ss, tt
Ballybackagh				1,670	1,495	1,583	gj
Lough Gowna		1,471	2,003	1,451	1,281	1,552	ms, ma, lg, gg
Delvin River - Hampton Cove		2,084	1,943	902	1,232	1,540	cx, tt
South Mayo Coast	2,035	1,593	1,331	1,936	707	1,520	rp, ss
L. Coy - Blackrock - Bullaunagh - Ballylee	1,795	2,123	1,392		737	1,512	ws

Species codes, together with 1% thresholds for national and international importance, are defined in the Appendix

\* indicates poor quality count, not included in the calculation of the mean

(+1) indicates an improvement in status from national to international when compared to previous period (2011/12 – 2014/15)

**Other nationally important sites (mean and species):-** Bandon Estuary (1419) et, h., bw, gk, Wexford Bay (1400) cx, rh, Lough Sheelin (1365) po, tu, lg, gg, River Shannon (Lower) Aerial (1353) po, tu, Cabragh Wetlands (1312) t., River Shannon (Lower) (1282) tu, lg, Rostaff Lake (1273) gj, sv, Castleplunket Turloughs (1273) sv, Lough Mask (1218) tu, lg, Stick Estuary (Oysterhaven) (1182) bw, Broadhaven & Sruwadaccon Bays (1174) rm, nd, rp, ss, Waterford Harbour (1165) gg, Blackwater Callows (1153) bw, Lough Carra (1141) ga, gn, Achill Island (+1) (1130) rm, Kilcolman Marsh (1130) t., sv, Kilglassan Turlough/ Greaghans (1044) ws, South East Clare Lakes (1004) gj, ga, lg, Lambay Island (+1) (966) ca, cu, River Suir Lower (938) gj, Doolough Headford (Turloughcor) (927) ga, sv, Annaghmore Lakes (+1) (910) sv, Inishmore, Aran Islands (852) ss, Ireland's Eye (+1) (809) tt, Mullet West (739) by, ss, Castlemaine Outer: Inch offshore (722) ss, Charleville Lagoons

(703) sv, Termon Turloughs (594) sv, lg, Ballyconneely Bay (585) rp, ss, Dunfanaghy Estuary (+1) (584) ss, Pat Reddan's Lake (581) ga, sv, Omey Strand (569) rp, ss, Ventry Harbour (564) rp, Marlfield Lake (475) ga, lg, Ballycrenane/Warren (458) tt, Mannin Bay (444) nd, rp, ss, Lough Eorna (419) lg, Lough Aderry (410) ga, Lough Arrow (402) lg, Swellan Lough (309) ms, Whiting Bay (303) ss, Blarney Lake (278) ga, Carrowmore Beach (278) ss, Knock Lake (+1) (263) lg, Magharees Islands (+1) (239) by, Grand Canal (Dublin) (+1) (217) ms, Buckronev Fen (187) ga, Lough Glove (164) lg, Kilkeran Lake (130) lg.



Bar-tailed Godwits (Dick Coombes)

## Waterbird trends

The trends of 43 species were measured for the period 1994/95 to 2015/16 (Table 7). Overall mean annual increases of 2% or more per year were recorded for nine species, with greatest increases seen in Little Egret, Light-bellied Brent Goose, Sanderling, Black-tailed Godwit and Common Scoter. Declines of 2% or more per year were recorded for eleven species, and were greatest for Bewick's Swan, Scaup, Pochard, Purple Sandpiper, Lapwing and Dunlin.

The assessment of short-term trends for the period 2011/12 to 2015/16, showed that greatest recent increases have been in numbers of Little Egret, Common Scoter, Greylag Goose, Grey Heron and Little Grebe. The greatest short-term declines over the same period have been shown in Barnacle Goose, Grey Plover, Scaup, Pochard, Light-bellied Brent Goose and great Crested Grebe.

The trends of a selection of the most numerous wader and wildfowl species (as per Table 3a) that are well-monitored through I-WeBS are shown in Figure 2. Given that they tend to be present in very large flocks, these species often account for most of the birds at wetland sites. Increases or declines in their numbers, therefore, are likely to

disproportionately affect the overall total number of waterbirds using a given site each winter.

Of the four most numerous wader species in 2015/16 all were declining in the short term, with Golden Plover experiencing a large decline of almost 12% over the period 2011/12 to 2015/16 (Table 7). Over the 22 years examined for the long-term trends Golden Plover, Lapwing and Dunlin were all declining, whilst Oystercatcher numbers were stable.

Amongst the wildfowl species, Wigeon, Teal and Mallard have all been stable across the long term, with Light-bellied Brent Geese undergoing a mean annual increase of 4.82% since 1994/95. Both Teal and Mallard have maintained a stable trend in the short term too, with Wigeon undergoing a modest short-term increase of 2.79%. Numbers of Light-bellied Brent Goose are significantly higher than they were when I-WeBS began in 1994/95, but dramatic increases resulting from good breeding seasons have been moderated by almost complete breeding failure every third year or so, and Brent Geese have undergone a short-term decline of 16.5% as a result (Table 7).

Table 7. Waterbird trends, indicating the mean annual change for the long-term period (1994/95 – 2015/16), and the mean annual change for the short-term period (2011/12 – 2015/16).

Species	Trend	Long-term: mean annual change 1994/95 - 2015/16 (%)	Short-term mean annual change (2011/12 – 2015/16) (%)
Mute Swan	Stable	0.48	4.06
Bewick's Swan	Decline	-17.51	*
Whooper Swan	Stable	1.33	-3.42
Greenland White-fronted Goose	Stable	-0.96	-6.18
Greylag Goose	Decline	-2.15	9.57
Barnacle Goose	Increase	2.62	-25.16
Light-bellied Brent Goose	Increase	4.82	-16.52
Shelduck	Stable	-1.46	-0.04
Wigeon	Stable	-1.83	2.79
Gadwall	Increase	2.26	-7.25
Teal	Stable	0.11	-0.32
Mallard	Stable	-1.40	-0.96
Pintail	Stable	-0.88	-9.75
Shoveler	Stable	-0.34	-2.53
Pochard	Decline	-9.14	-22.0
Tufted Duck	Stable	0.05	-9.46
Scaup	Decline	-13.2	-22.94
Common Scoter	Increase	3.45	11.53
Goldeneye	Decline	-4.29	-12.53
Red-breasted Merganser	Stable	-0.92	-5.12
Red-throated Diver	Stable	1.13	0.80
Great Northern Diver	Stable	0.68	-1.37
Little Grebe	Increase	2.38	6.47
Great Crested Grebe	Stable	-0.14	-13.7
Little Egret	Increase	27.19	14.01
Grey Heron	Stable	0.88	7.23
Moorhen	Stable	1.13	-7.00
Coot	Stable	-0.19	-3.45
Oystercatcher	Stable	0.83	-3.94
Ringed Plover	Stable	-0.03	-5.69
Golden Plover	Decline	-3.45	-11.92
Grey Plover	Decline	-3.64	-23.22
Lapwing	Decline	-5.17	-8.11
Knot	Stable	-0.37	-11.63
Sanderling	Increase	3.86	-10.83
Purple Sandpiper	Decline	-5.60	-4.96
Dunlin	Decline	-4.81	-4.48
Black-tailed Godwit	Increase	3.47	0.83
Bar-tailed Godwit	Stable	0.53	-7.57
Curlew	Decline	-2.79	-1.75
Greenshank	Increase	2.65	1.21
Redshank	Stable	0.68	-1.37
Turnstone	Stable	0.31	-11.82

\* Generating short and medium-term trends for Bewick's Swan based on these analyses was not possible because of the small sample size of sites that the species is currently present at.

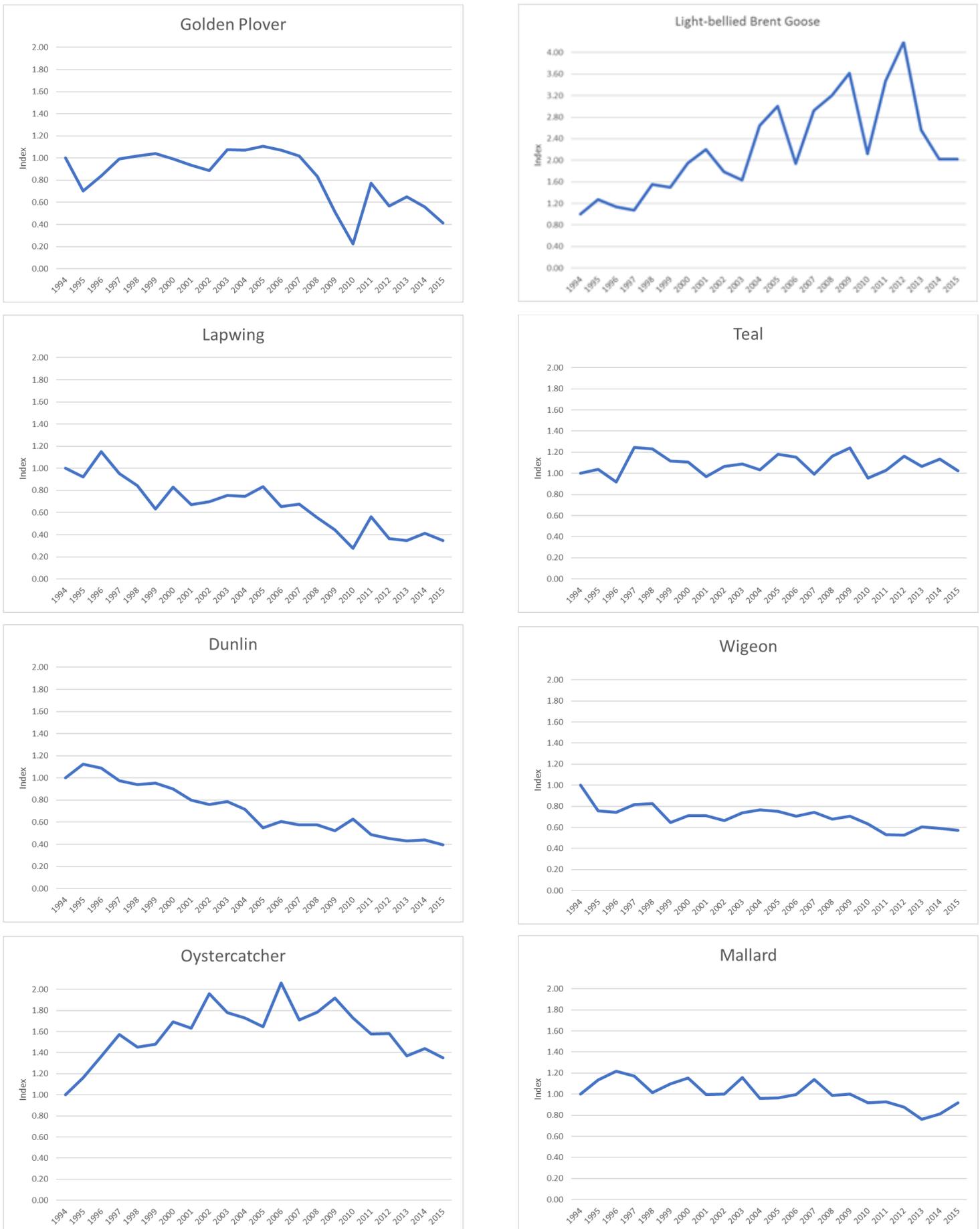


Figure 2. Long-term trends (1994/95 – 2015/16) for some of the most numerous wader and wildfowl species during the 2015/16 I-WeBS season. See Table 3a for monthly count numbers. The Y-axis on each graph ranges from 0 to 2, except for the Light-bellied Brent Goose graph which ranges from 0 to 4.

## **Discussion**

Count coverage during the 2015/16 season was good, though slightly below that of the previous winter. However, the majority of key sites were still covered in three or more months.

The weather during winter 2015/16 brought widespread and prolonged flooding, with many parts of the country recording their wettest winter on record. Temperatures were generally above long-term averages throughout the winter, with the weather noted as wet, mild and dull for much of December, January and February in many parts of the country. The widespread flooding may have resulted in some local movements of waterbirds away from some overly-flooded subsites and onto areas not regularly used.

The highest numbers of 'wildfowl and allies' and 'waders' were recorded in January, with November having the second highest numbers of both groups. Often, numbers in December are higher than those in November as more birds arrive into Ireland and wetland sites by mid-winter. However, much of the discrepancy between recorded numbers in November and December 2015 is likely an artefact of coverage. For example, much of the difference between wildfowl counts in December and November are due to much higher numbers of Greylag and Light-bellied Brent Goose being recorded as part of species-focused work in those months. To a lesser extent, higher numbers of Shelduck and Common Scoter also account for some of the discrepancy between those months. Recorded numbers of Knot, Oystercatcher, Black-tailed Godwits and Bar-tailed Godwits in November were all considerably higher than those in December. The relatively low number of waterbirds recorded in December is also likely a product of reduced survey coverage in that month, as Dundalk Bay, Inner Galway Bay, Lough Swilly and Ballymacoda Bay were not counted in December 2015. As in previous years the number of gulls and terns peaked in September, buoyed by the addition of large numbers of Lesser Black-backed Gulls and a few hundred Sandwich Terns that were not recorded in subsequent months. High numbers of Black-headed Gulls and Common Gulls formed the largest part of this group in January, when the second-highest numbers of gulls and terns were recorded.

The list of sites supporting internationally important numbers of waterbirds was higher than the previous reporting period, a welcome increase given that there have been several successive winters with declining numbers at such sites. Four sites supported internationally important numbers of waterbirds having not done so previously, three of those as a result of waterfowl species: Whooper Swan at Shannon and Fergus Estuary Aerial, Light-bellied Brent Geese at The Cull & Killag (Ballyteige) and Barnacle Goose at Dunfanaghy New Lake. Three key sites observed increases in total numbers of greater than 10% since the last publication while another three experienced declines of a similar extent.

There was a net increase in the number of sites supporting nationally important numbers of waterbirds, with 12 sites promoted and nine sites relegated from this list since 2014/15. Two sites moved from supporting internationally- to supporting nationally-important numbers of waterbirds – Lough Corrib, which had supported internationally important numbers of Pochard, and the Shannon and Fergus Estuary which formerly held internationally important numbers of Black-tailed Godwit. It is likely that the decline of Black-tailed Godwits at the Shannon and Fergus Estuary is a result of incomplete coverage of the site during the period examined however, particularly given the long-term increase and short-term stable trend at national level for this species.

Attention should be drawn to the continued decline in numbers of several waterbird species, with 11 species showing long-term declines and 27 species showing short-term declines out of the 43 species examined in Table 7. Four species showed short-term declines of greater than 20%, including Scaup and Pochard which exhibit significant declines in the long-term also. Goldeneye also showed worrying declines in both the short and long term. Barnacle and Light-bellied Brent Geese, although showing long-term increases, showed large declines (25% and 16.5% respectively) in the five winters leading up to 2015/16. In contrast, Greylag Geese were declining over the long-term but showed a 9.6% increase in the short term. Of 26 wildfowl and allies examined, six species showed long term declines and 21 species showed short-term declines. Amongst the waders, Grey Plover, Golden Plover, Lapwing, Purple Sandpiper, Dunlin and Curlew all showed decreases in both the short and long term. Worryingly, of the 15 waders examined, 13 showed short-term declines and four were classed as stable in the short-term, but none showed an increasing trend. Short-term increases were seen in wildfowl and ally species only, including common and widespread species such as Little Egret, Grey Heron, Little Grebe and Mute Swan. There are currently 12 wintering waterbird species that are red-listed in Ireland (Colhoun and Cummins 2013), and all are declining at flyway level (Wetlands International 2012). Of that list, all but one (Wigeon) show a negative short-term trend and seven are declining in the long-term. None show a long-term increase.



Wigeon (Dick Coombes)

In contrast, numbers of Little Egret, Common Scoter and Little Grebe show increasing trends in both the short and long term, and Grey Heron, Mute Swan and Wigeon were all stable in the long-term and increased in the short-term. It should be noted however, that the short-term increase in the numbers of Common Scoter may be due to targeted surveys undertaken during 2015/16 at Blacksod Bay, Co. Mayo where counts were undertaken in optimal weather conditions to establish more accurate population estimates for this site (Suddaby 2016).

The third Non-Estuarine Waterbird Survey (NEWS-III) took place from December 2015 to February 2016, organised under the auspices of I-WeBS (Lewis et al. 2017). Uptake from existing I-WeBS counters and new volunteers was high, with a total of 2,095 km of non-estuarine coastline surveyed across the Republic and Northern Ireland (63% of total non-estuarine coastline). A total of 110,061 birds of 72 species were recorded, nearly half of which were waders. Herring Gull was the most numerous species recorded overall, with Black-headed Gull the second most numerous gull. Oystercatcher was the most numerous wader, though significant numbers of Curlew, Dunlin, Lapwing, Sanderling and Ringer Plover were also recorded. Among the wildfowl and allies, Shag, Cormorant and Common Scoter were the most numerous. Overall NEWS-III shows that non-estuarine coastal habitats continue to support a broad diversity of waterbirds, and is especially important for divers, seaducks, Cormorant, Grey Heron and several waders; most notably Ringed Plover, Sanderling, Purple Sandpiper, Greenshank and Turnstone. The recorded total of 110,000 waterbirds is an increase on the total recorded by NEWS-II and likely a reflection of increased coverage during NEWS-III. Importantly, population estimates determined during NEWS-III will feed into the forthcoming updated national and all-Ireland waterbird population estimates (Lewis et al. 2017).

The value of I-WeBS continues to be shown in demonstrating the importance of several of our wetland sites, and the short- and long-term trends for the majority of our waterbird species, particularly those of conservation concern. Good counter coverage, particularly in January, informs the status of species at flyway level and the high level of site coverage and counter involvement in the third Non-Estuarine Waterbird Survey in 2015/16 attests to the reliability of the counter network and the success of I-WeBS as a whole. The continued enhancement of that counter network, in terms of counter numbers and participation, site-coverage and co-ordination at national and local scales, will continue to be of vital importance going forward in addressing Ireland's obligations to monitor our wintering waterbirds and wetlands under the EU Birds Directive.

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## Appendix

Scientific names of all 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>		90
Bewick's Swan	<i>Cygnus columbianus</i>	20	220
Whooper Swan	<i>Cygnus cygnus</i>	150	270
Pink-footed Goose	<i>Anser brachyrhynchus</i>		3500
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>	150	710
Light-bellied Brent Goose	<i>Branta bernicla hrota</i>		400
Shelduck	<i>Tadorna tadorna</i>	120	3000
Wigeon	<i>Anas penelope</i>	630	15000
Gadwall	<i>Anas strepera</i>	20	600
Teal	<i>Anas crecca</i>	340	5000
Mallard	<i>Anas platyrhynchos</i>	290	20000
Pintail	<i>Anas acuta</i>	20	600
Shoveler	<i>Anas clypeata</i>	30	400
Pochard	<i>Aythya ferina</i>	160	3000
Tufted Duck	<i>Aythya fuligula</i>	310	12000
Scaup	<i>Aythya marila</i>	65	3100
Long-tailed Duck	<i>Clangula hyemalis</i>		17250
Eider	<i>Somateria mollissima</i>	35	14840
Common Scoter	<i>Melanitta nigra</i>	140	5500
Goldeneye	<i>Bucephala clangula</i>	60	11500
Smew	<i>Mergellus albellus</i>		400
Red-breasted Merganser	<i>Mergus serrator</i>	20	1700
Red-throated Diver	<i>Gavia stellata</i>	20	3000
Black-throated Diver	<i>Gavia arctica</i>		3750
Great Northern Diver	<i>Gavia immer</i>	20	50
Little Grebe	<i>Tachybaptus ruficollis</i>	20	4000
Great Crested Grebe	<i>Podiceps cristatus</i>	40	3500
Slavonian Grebe	<i>Podiceps auritus</i>		55
Cormorant	<i>Phalacrocorax carbo</i>	120	1200
Shag	<i>Phalacrocorax aristotelis</i>		2000
Little Egret	<i>Egretta garzetta</i>	20	1300
Grey Heron	<i>Ardea cinerea</i>	25	2700
Moorhen	<i>Gallinula chloropus</i>		20000
Coot	<i>Fulica atra</i>	220	17500
Oystercatcher	<i>Haematopus ostralegus</i>	690	8200
Ringed Plover	<i>Charadrius hiaticula</i>	100	730
Golden Plover	<i>Pluvialis apricaria</i>	1200	9300
Grey Plover	<i>Pluvialis squatarola</i>	30	2500
Lapwing	<i>Vanellus vanellus</i>	1100	20000
Knot	<i>Calidris canutus</i>	280	4500
Sanderling	<i>Calidris alba</i>	60	1200
Little Stint	<i>Calidris minuta</i>		3000
Curlew Sandpiper	<i>Calidris ferruginea</i>		10000
Purple Sandpiper	<i>Calidris maritima</i>	20	710
Dunlin	<i>Calidris alpina</i>	570	13300
Ruff	<i>Philomachus pugnax</i>		12200
Jack Snipe	<i>Lymnocyptes minimus</i>		20000
Snipe	<i>Gallinago gallinago</i>		20000
Black-tailed Godwit	<i>Limosa limosa</i>	190	610
Bar-tailed Godwit	<i>Limosa lapponica</i>	150	1200
Whimbrel	<i>Numenius phaeopus</i>		6700
Curlew	<i>Numenius arquata</i>	350	8400
Green Sandpiper	<i>Tringa ochropus</i>		15500
Spotted Redshank	<i>Tringa erythropus</i>		900
Greenshank	<i>Tringa nebularia</i>	20	2300
Redshank	<i>Tringa totanus</i>	300	3900
Turnstone	<i>Arenaria interpres</i>	95	1400
Mediterranean Gull	<i>Larus melanocephalus</i>		770
Black-headed Gull	<i>Chroicocephalus ridibundus</i>		20000
Common Gull	<i>Larus canus</i>		16400
Lesser Black-backed Gull	<i>Larus fuscus</i>		5500
Herring Gull	<i>Larus argentatus</i>		10200
Great Black-backed Gull	<i>Larus marinus</i>		4200

<sup>1</sup> Crowe and Holt. 2013

<sup>2</sup> Wetlands International 2012