



# IRISH WETLAND BIRD SURVEY: RESULTS OF WATERBIRD MONITORING IN IRELAND IN 2016/17 AND 2017/18



**BirdWatchIreland**



An Roinn Tithíochta, Rialtais  
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The Irish Wetland Bird Survey (I-WeBS) is coordinated and delivered by BirdWatch Ireland under contract to the National Parks and Wildlife Service. We give sincere and special thanks to all of the dedicated observers (largely BirdWatch Ireland volunteers and staff, and staff of the National Parks and Wildlife Service) who have participated in this survey in the winters of 2016/17 and 2017/18.

### **Front Cover Photos:**

B. Burke (Whooper Swan, Light-bellied Brent Geese, Tufted Duck, Black-tailed Godwit), C. Clarke (Shelduck), R.T. Mills (Lapwing), C. Timmons (Ringed Plover, Golden Plover).

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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.
- The survey is undertaken by experienced volunteer counters and staff of BirdWatch Ireland and staff from the National Parks and Wildlife Service. Counters record the number of individuals of each waterbird species on frequent visits to their pre-defined wetland sites. Counts are scheduled to be undertaken once per month between September and March inclusive, and on or near pre-determined dates.
- This report aims to summarise the results of the survey in the winters of 2016/17 and 2017/18 and provides an update on the status of wintering waterbirds and their key sites.
- In 2016/17, 271 sites comprising 905 subsites were covered, followed by 250 sites comprising 820 subsites in 2017/18, including the majority of principal sites in both seasons. Some 68% of sites were covered in three or more months of both 2016/17 and 2017/18.
- In 2016/17, 105 waterbird species were recorded, including 60 of which that were regularly occurring. In 2017/18, 99 species were recorded, including 61 regularly-occurring species. Numbers of total waterbirds peaked in January in both seasons, at 432,323 in 2017 and 382,387 in 2018.
- As a group, waders were the most numerous in all months of both seasons. Golden Plover, Lapwing, Dunlin and Oystercatcher were the most numerous wader species. The most numerous wildfowl and ally species were Wigeon, Teal and Light-bellied Brent Goose. Black-headed Gull was the most numerous gull species, followed by Herring and Common Gull.
- Based on the mean of peak counts between 2013/14 and 2017/18, 41 sites were identified to support wintering waterbird species in numbers of international importance, five more than during the previous reporting period (2011/12–2015/16). Each of the 11 sites newly listed as supporting numbers of international importance qualified on the basis of Mute Swan numbers exceeding the 1% threshold, which for this closed population is the same as the 1% national threshold.
- 93 sites supported numbers of national importance, three fewer than during the previous reporting period.
- Sites with a five-year average of 20,000+ waterbirds were Dundalk Bay, Lough Swilly, Dublin Bay, Wexford Harbour & Slobs, and Cork Harbour, the same as the previous reporting period.

## Introduction

The importance of Ireland's wetlands for wintering waterbirds has long been recognised (e.g. Hutchinson 1989, Sheppard 1993, Crowe 2005). Ireland's position along a major migratory route, as well as extensive areas of wetland and a relatively mild climate, means that our coastal and inland wetlands attract significant numbers of waterbirds during winter, the most recent estimate showing that just over three-quarters of a million waterbirds spend winter in Ireland (Burke *et al.* 2018a). Most species originate from breeding grounds in the north and northwest (principally Canada, Greenland and Iceland), or from the northeast (northern Europe, Scandinavia, Russia and Siberia).

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 the winter of 1994/95. The survey is coordinated by the I-WeBS Office based at BirdWatch Ireland, under contract to the National Parks and Wildlife Service. The primary objective of I-WeBS is to monitor the numbers and distribution of waterbird populations wintering in the Republic of Ireland, and the survey focuses on wintering waterbirds, as opposed to autumn and spring migrants.

Collectively, the waterbird data collected have been used to provide a basis for site selection and designation of Special Protection Areas (SPAs) under the European Birds Directive (2009/147/EC), and for reporting on the long-term monitoring of these wetland sites (e.g. Crowe 2005, Lewis *et al.* 2019). In addition, these data enable the population size and trends of a range of waterbird species to be described. Further, the results often form the basis for informed decision-making by planners, conservationists and developers on the sustainable use and management of wetland habitats and their waterbird communities. I-WeBS, together with associated species-specific surveys such as the International Swan Census (e.g. Hall *et al.* 2016) provide the principal tools used in the conservation of wintering waterbird populations in Ireland and the wetlands that they rely upon. Now having surpassed the 25<sup>th</sup> survey season in the winter of 2018/19, the survey is ongoing and aims to continue to monitor wintering waterbird populations and importance of the wetlands upon which they rely. This report presents summarised results of data collated in the winters of 2016/17 (season 23) and 2017/18 (season 24).

## 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 survey visits to pre-defined wetland sites. 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 both duplicate counting of birds and potentially missing 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.

Additional data for cross-border sites such as Carlingford Lough, were provided by the UK Wetland Bird Survey.

### Analyses

Total waterbird numbers at each site were calculated by summing the species peak count in each season, and a mean peak count was based on the most recent five-season period (2013/14 – 2017/18). 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 Bureau (1971), in that a site was deemed to support numbers of international importance if it regularly supported 1% or more of the flyway population (or biogeographic unit) of one species or subspecies of waterbird - i.e. the five-year mean peak exceeded the 1% flyway (international) threshold. Similarly, a site was deemed to support numbers of national importance if it regularly supported 1% or more of the all-Ireland estimate of a species. National and International importance thresholds are listed in Appendix 1. The international, or flyway, thresholds were based on AEWA Conservation Status Review 7 (CSR7) (AEWA 2018 - available on [wpe.wetlands.org](http://wpe.wetlands.org)), while the all-Ireland thresholds are based on Burke *et al.* (2018a).

## Results

### Count coverage

In total, 271 sites comprising 905 subsites were covered in 2016/17 (Figure 1) and 250 sites comprising 820 subsites were covered in 2017/18 (Figure 2). Nearly half of the sites were lakes (45% and 43% for Seasons 23 and 24 respectively), while a third were coastal in nature (estuaries, non-estuarine coast and lagoons). The remaining sites were made up of rivers & canals (12%), turloughs (*c.*7%), bog/marsh (2%), and grassland, reservoirs and quarry/gravel pits at *c.*1% of sites, with 9-10 sites of unknown habitat type in the two seasons. Greatest coverage was in January of both seasons (89% and 90% respectively) (Table 1).

Some 76 sites (28%) were covered in all seven months of 2016/16, and 52 sites (21%) were covered in all seven months of winter 2017/18. Some 68% of sites were covered in three or more months of both 2016/17 and 2017/18.

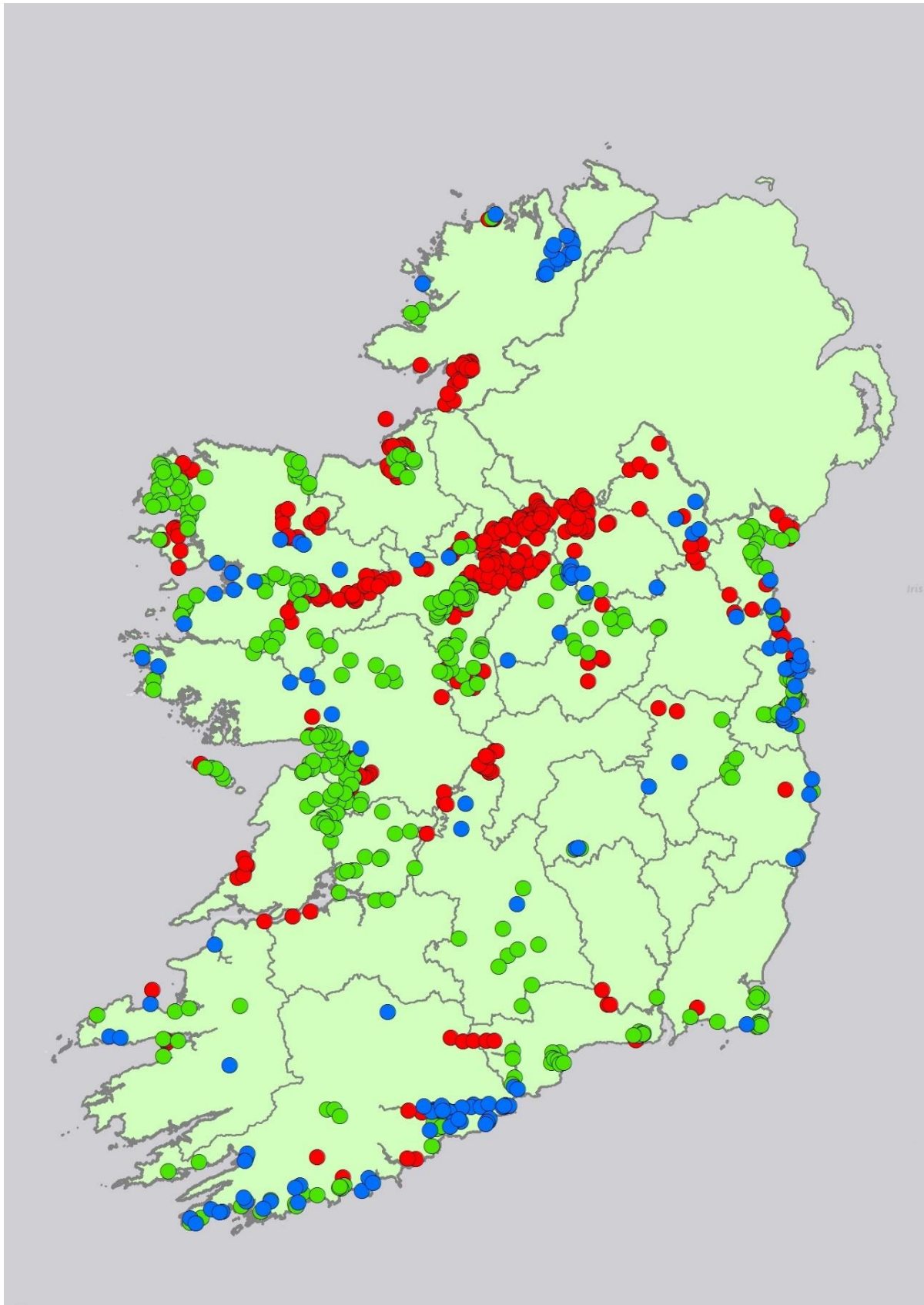
**Table 1.** Number of sites and subsites covered each month and overall, during winters 2016/17 and 2017/18

2016/17 (Season 23)			2017/18 (Season 24)	
Month	Number of sites	Number of subsites	Number of sites	Number of subsites
Sep	128	287	93	237
Oct	145	363	114	277
Nov	156	469	157	396
Dec	169	486	148	436
Jan	241	840	224	758
Feb	151	404	153	435
Mar	147	393	121	300

Data were received for most sites that previously supported waterbirds in numbers of national and international importance (Table 2) although a few key sites that are designated as Special Protection Areas (SPA) were not counted during seasons 23 or 24. Full details of coverage at SPA sites is given in Table 2.

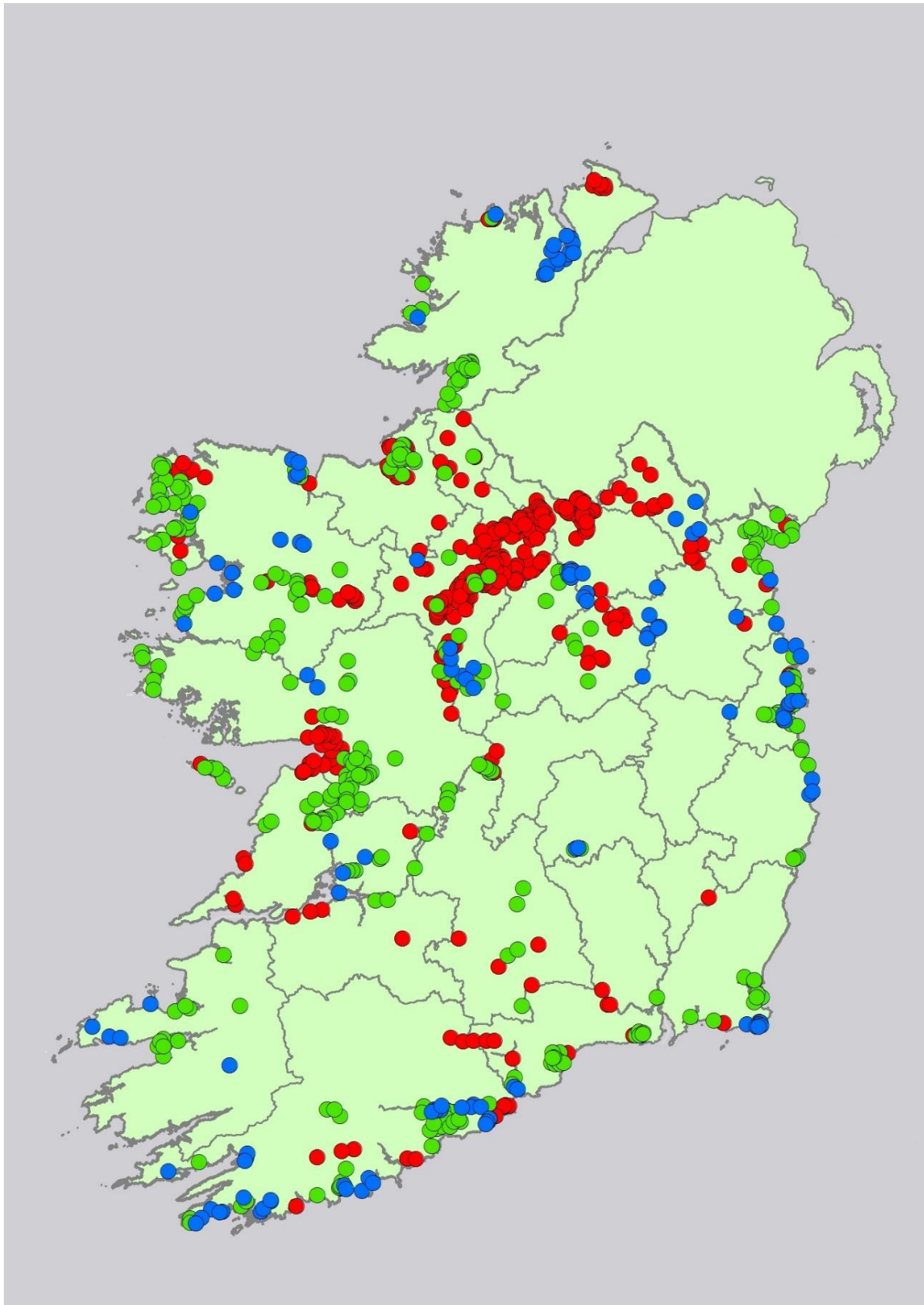
No aerial surveys took place during the 2016/17 or 2017/18 seasons.





**Figure 1.** Subsites covered during 2016/17, illustrating the frequency of coverage: red = covered on at most two occasions during the season, green = 3-6 occasions, blue = 7 or more occasions.





**Figure 2.** Subsites covered during 2017/18, illustrating the frequency of coverage: red = covered on at most two occasions during the season, green = 3-6 occasions, blue = 7 or more occasions.

**Table 2.** Coverage of SPA sites in 2016/17 and 2017/18. \* indicates counts done but not received at time of analysis for this report. \*\* Only partial coverage of this site (see text for further discussion)

SPA Code	Site	Number of Counts			SPA Code	Site	Number of Counts		
		S23	S24	Required			S23	S24	Required
4009	Lady's Island Lake	6	7	2	4062	Lough Mask	5	7	-
4013	Drumcliff Bay Estuary	2	2	2	4063	Poulaphouca Reservoir	3	0	-
4014	Rockabill	0	0	-	4064	Lough Ree	7	3*	3
4015	Rogerstown Estuary	7	7	3	4065	Lough Sheelin	5	2	-
4016	Baldoyle Bay	6	3	2	4069	Lambay Island	0	0	-
4019	Wexford Bay			3	4075	Lough Swilly	7	7	4
4020	The Cull & Killag (Ballyteige)	5	4	3	4076	Wexford Harbour & Slobs	3	3	4
4022	Ballycotton Shanagarry	7	7	2	4077	Shannon & Fergus Estuary	7 **	7 **	-
4023	Ballymacoda	7	2	4	4078	Carlingford Lough (RoI)	1	6	3
4024	Dublin Bay	7	7	4	4080	Boyne Estuary	8	6	3
4025	Broadmeadow (Malahide) Estuary	7	7	3	4081	Clonakilty Bay	6	7	3
4026	Dundalk Bay	5	4	4	4086	Little Brosna Callows	3	4	4
4027	Tramore Back Strand	3	3	2	4087	Lough Foyle	0	0	-
4028	Blackwater Estuary	7	7	3	4089	Rahasane Turlough	6	3	3
4029	Castlemaine Harbour & Rossbehy	6	6	3	4090	Sheskinmore Lough	6	5	-
4030	Cork Harbour	7	7	4	4091	Braganstown	0	2	-
4031	Inner Galway Bay	3	2	3	4092	Tacumshin Lake	7	6	4
4032	Dungarvan Harbour	4	4	4	4093	Termoncarragh & Annagh Marsh	4	3	-
4033	Bannow Bay	5	4	3	4094	Blackwater Callows	1	1	2
4034	Trawbreaga Bay	0	1	2	4095	Kilcolman Marsh	7	0	-
4035	Sligo Harbour	4	3	2	4096	Shannon Callows	1	4	-
4036	Killala Bay	7	7	2	4097	River Suck	7	4	-
4037	Blacksod & Tullaghan Bays	7	7	3	4107	Coole Lough - Newtown Turlough	5	3	-
4037	Broadhaven & Sruwadaccon Bays	2	2	3	4109	Inishcarra Reservoirs	6	4	3

SPA Code	Site	Number of Counts			SPA Code	Site	Number of Counts		
		S23	S24	Required			S23	S24	Required
<b>4037</b>	Blacksod & Tullaghan Bays	7	7	3	<b>4107</b>	Coole Lough - Newtown Turlough	5	3	-
<b>4037</b>	Broadhaven & Sruwadacon Bays	2	2	3	<b>4109</b>	Inishcarra Reservoirs	6	4	3
<b>4038</b>	Lough Leane & Killarney Valley	7	7	-	<b>4122</b>	Skerries Islands	0	0	-
<b>4041</b>	Ballyallia Lake	6	6	-	<b>4129</b>	Ballysadare Bay	3	3	2
<b>4042</b>	Lough Corrib	6	6	4	<b>4134</b>	Lough Rea	0	5	2
<b>4043</b>	Lough Derravaragh	4	3	2	<b>4140</b>	Southern Roscommon Lakes	7	6	-
<b>4044</b>	Lough Ennell	1	4	2	<b>4151</b>	Donegal Bay	2	4	3
<b>4045</b>	Glen Lough	5	1	-	<b>4158</b>	Nanny Estuary & shore	7	7	3
<b>4046</b>	Lough Iron	7	3	2	<b>4182</b>	Mid-Clare Coast (Mal Bay - Doonbeg Bay)	2	3	3
<b>4047</b>	Lough Owel	3	2	-	<b>4186</b>	North Wicklow Coastal Marshes	7	7	3
<b>4048</b>	Lough Gara	7	7	-	<b>4188</b>	Tralee Bay, Lough Gill & Akeragh Lough	7	7	4
<b>4049</b>	Lough Oughter Complex	1	2	2	<b>4194</b>	Dunfanaghy New Lake	7	7	-
<b>4050</b>	Lough Arrow	0	1	-	<b>4212</b>	South Mayo Coast	6	7	-
<b>4052</b>	Carrowmore Lake	4	2	-	<b>4219</b>	Courtmacsherry Bay, Broadstrand Bay & Dunworley	7	7	3
<b>4056</b>	Lough Cutra - Ballynakill L.	5	3	-	<b>4220</b>	Corofin Wetlands	4	5	2
<b>4058</b>	Lough Derg (Shannon)	3	7	-	<b>4228</b>	Lough Cullin	7	7	-
<b>4061</b>	Lough Kinale & Derragh Lough	6	7	-	<b>4228</b>	Lough Conn	7	7	-

## Total waterbird numbers

Overall, 105 waterbird species were recorded in 2016/17, including 56 wildfowl and allies, 31 waders, 11 gulls, six terns and Kingfisher. Total numbers of waterbirds recorded rose from 112,891 in the month of September to a maximum of 432,323 in January. A total of 99 waterbird species was recorded in 2017/18, including 54 wildfowl and allies, 27 waders, 11 gulls, six terns and Kingfisher. Total numbers of waterbirds again peaked in January at 382,387 waterbirds.

Tables 3a and 3b show total waterbird counts for the 2016/17 and 2017/18 seasons respectively, along with the species counts for regularly occurring species; defined as those species 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. Note that species scientific names are provided in Appendix 2.

The numbers of wildfowl and allies peaked in January of both seasons (142,621 and 147,015 for seasons 23 and 24 respectively), as did the numbers of waders (250,998 and 205,250 respectively). The total number of gulls and terns peaked in the month of January in 2016/17 (season 23) (38,696) and in the month of December in 2017/18 (season 24) (32,652).

A total of 60 regularly occurring species were recorded in 2016/17 (Table 3a) and 61 in winter 2017/18 (Table 3b). As a group, waders dominated in terms of numbers in all months of both seasons (Figure 3, 4), with numbers representing between 43% (March 2018) and 58% (January 2017) of monthly waterbird totals throughout the count period. Wildfowl and their allies comprised between 24% and 42% of total waterbirds, while gulls and terns comprised between 8% and 29% (Figure 3, 4), across the two seasons.

Amongst the waders, Golden Plover was the most numerous with numbers peaking at 70,726 individuals in January 2017. Thereafter Lapwing, Dunlin and Oystercatcher were the most numerous waders (Tables 3a and 3b). Amongst the wildfowl and allies, Wigeon was the most abundant in both seasons, numbers peaking at 38,876 individuals (January 2017). Teal and Light-bellied Brent Goose were the next most abundant waterfowl species overall. Black-headed Gull was by far the most numerous of the gull species followed by Herring Gull and Common Gull.

In addition to the regularly occurring waterbird species, a further 45 scarce species (i.e. not meeting the criteria of 'regularly occurring' species) were also recorded during 2016/17, and 40 scarce species were recorded during winter 2017/18 (Table 4).

**Table 3a.** Total numbers counted of regularly occurring waterbirds between September 2016 and March 2017.

Species	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Mute Swan	2,783	3,341	3,218	3,220	3,839	1,745	1,608
Whooper Swan	5	733	2,759	3,527	4,873	2,530	1,684
Greenland White-fronted Goose		79	1,814	1,226	1,146	760	834
Greylag Goose	976	1,753	908	3,862	3,118	1,246	2,064
Canada Goose	345	426	240	262	279	21	29
Barnacle Goose		22	3,941	2,712	6,667		849
Light-bellied Brent Goose	212	3,867	16,191	13,657	15,366	10,841	15,589
Shelduck	132	1,003	4,207	5,321	6,515	4,810	3,377
Wigeon	4,269	31,382	34,399	30,173	38,876	18,264	10,676
Gadwall	145	162	347	1,579	377	183	98
Teal	4,276	8,394	13,825	13,071	18,750	12,811	7,745
Mallard	6,157	7,165	7,606	6,845	8,098	3,888	2,231
Pintail	6	184	364	588	1,189	476	335
Shoveler	213	395	748	1,382	1,527	1,019	313
Pochard	6	62	166	95	673	35	34
Tufted Duck	747	2,462	9,709	4,622	8,326	2,311	2,011
Scaup		50	167	75	87	81	13
Long-tailed Duck		1	23	39	52	3	11
Common Scoter	577	806	4,311	2,697	7,377	1,614	4,997
Goldeneye	2	21	352	456	805	248	126
Red-breasted Merganser	72	351	799	579	787	602	506
Red-throated Diver	13	160	243	81	258	26	114
Great Northern Diver	11	80	492	226	420	83	178
Little Grebe	1,096	1,242	948	904	850	463	233
Great Crested Grebe	342	587	879	801	861	428	261
Cormorant	1,655	1,911	2,933	2,083	2,987	1,167	970
Shag	367	171	421	498	970	95	163
Little Egret	808	529	528	264	361	277	339
Grey Heron	657	651	815	528	759	286	273
Water Rail	8	28	13	11	20	7	8
Moorhen	338	398	263	292	425	219	213
Coot	2,927	4,386	9,368	688	5,693	1,115	518
<b>Wildfowl &amp; Allies Total*</b>	<b>29,424</b>	<b>73,058</b>	<b>123,222</b>	<b>102,690</b>	<b>142,621</b>	<b>67,997</b>	<b>59,078</b>
Oystercatcher	13,272	13,092	21,480	20,009	29,797	12,536	10,731
Ringed Plover	2,418	2,574	3,028	2,022	3,743	1,055	335
Golden Plover	896	13,941	35,874	34,253	70,726	19,578	10,084
Grey Plover	189	357	897	961	1,361	1,063	725
Lapwing	2,292	9,105	18,286	28,438	42,514	13,164	2,269
Knot	659	923	6,133	13,613	12,353	6,791	11,381
Sanderling	1,167	1,401	2,236	1,613	2,178	1,341	1,162

Species	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Purple Sandpiper		5	16	5	27	1	32
Dunlin	6,947	8,134	23,344	24,070	31,812	26,230	9,097
Ruff	21	12	2	9	3	3	11
Snipe	195	196	324	550	418	303	157
Black-tailed Godwit	7,598	5,752	12,320	11,146	15,975	7,175	8,271
Bar-tailed Godwit	2,469	2,478	6,533	4,655	8,628	4,511	5,221
Whimbrel	100	4	2	8	9	1	3
Curlew	8,596	7,886	8,951	8,891	14,994	9,940	3,467
Common Sandpiper	6	9	4	5	8		2
Greenshank	525	649	643	479	601	421	447
Redshank	7,168	9,364	10,587	8,428	11,215	8,270	8,854
Turnstone	820	913	1,557	1,165	1,514	718	847
<b>Waders Total*</b>	<b>55,358</b>	<b>76,821</b>	<b>152,236</b>	<b>160,340</b>	<b>250,998</b>	<b>113,123</b>	<b>73,100</b>
Mediterranean Gull	181	119	56	12	91	35	14
Black-headed Gull	14,566	14,043	15,580	11,560	20,197	12,245	10,426
Common Gull	3,192	2,992	4,953	4,628	8,032	5,167	2,820
Lesser Black-backed Gull	2,130	2,714	2,380	3,063	3,319	2,975	1,360
Herring Gull	5,857	4,412	6,091	6,535	5,584	3,922	4,392
Iceland Gull				1	7	11	13
Glaucous Gull			1	1	10	12	4
Great Black-backed Gull	1,780	1,299	1,162	1,415	1,439	715	580
Sandwich Tern	256	4	4		7		10
<b>Gulls &amp; Terns Total*</b>	<b>28,100</b>	<b>25,583</b>	<b>30,227</b>	<b>27,263</b>	<b>38,696</b>	<b>25,084</b>	<b>19,633</b>
Kingfisher	9	23	15	19	8	5	
<b>Waterbirds Total*</b>	<b>112,891</b>	<b>175,485</b>	<b>305,700</b>	<b>290,312</b>	<b>432,323</b>	<b>206,209</b>	<b>151,811</b>

\* Totals include records of other waterbirds, including vagrant species listed in Table 4, feral or naturalised geese and ducks, as well as others that were not identified to species level (e.g. unidentified waders)

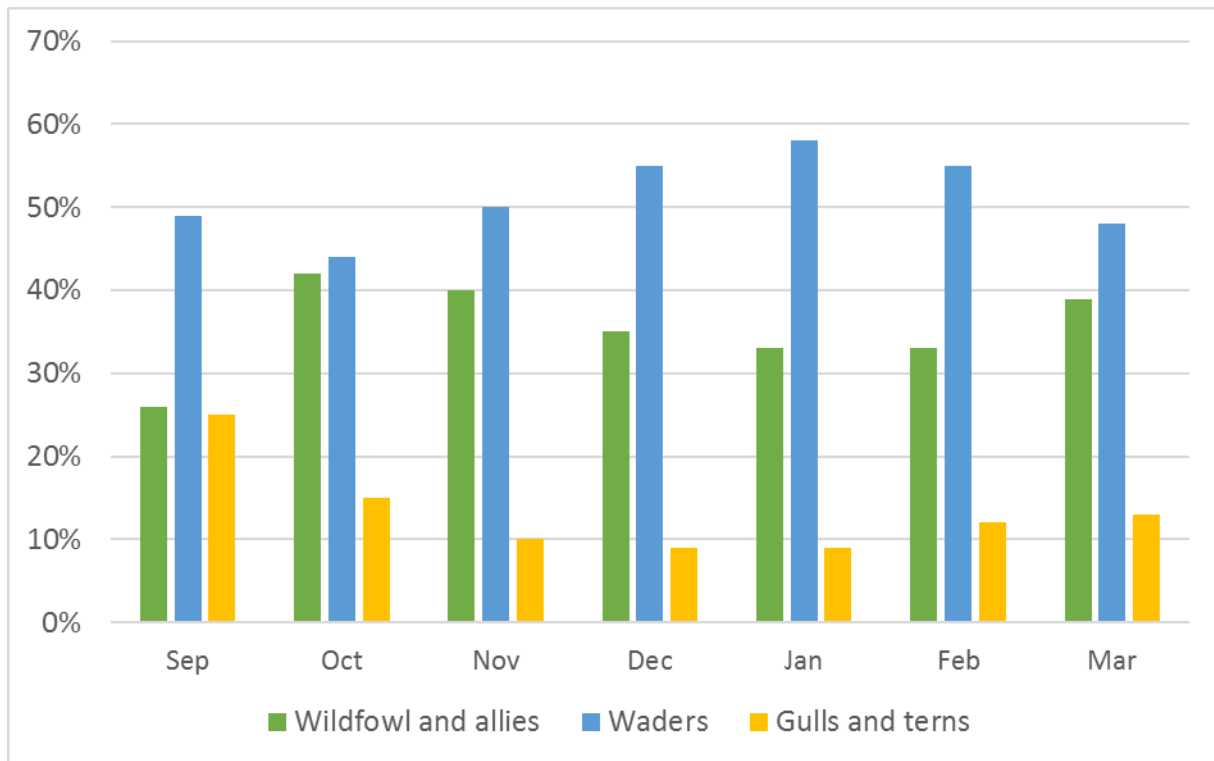


**Table 3b.** Total numbers counted of regularly occurring waterbirds between September 2017 and March 2018.

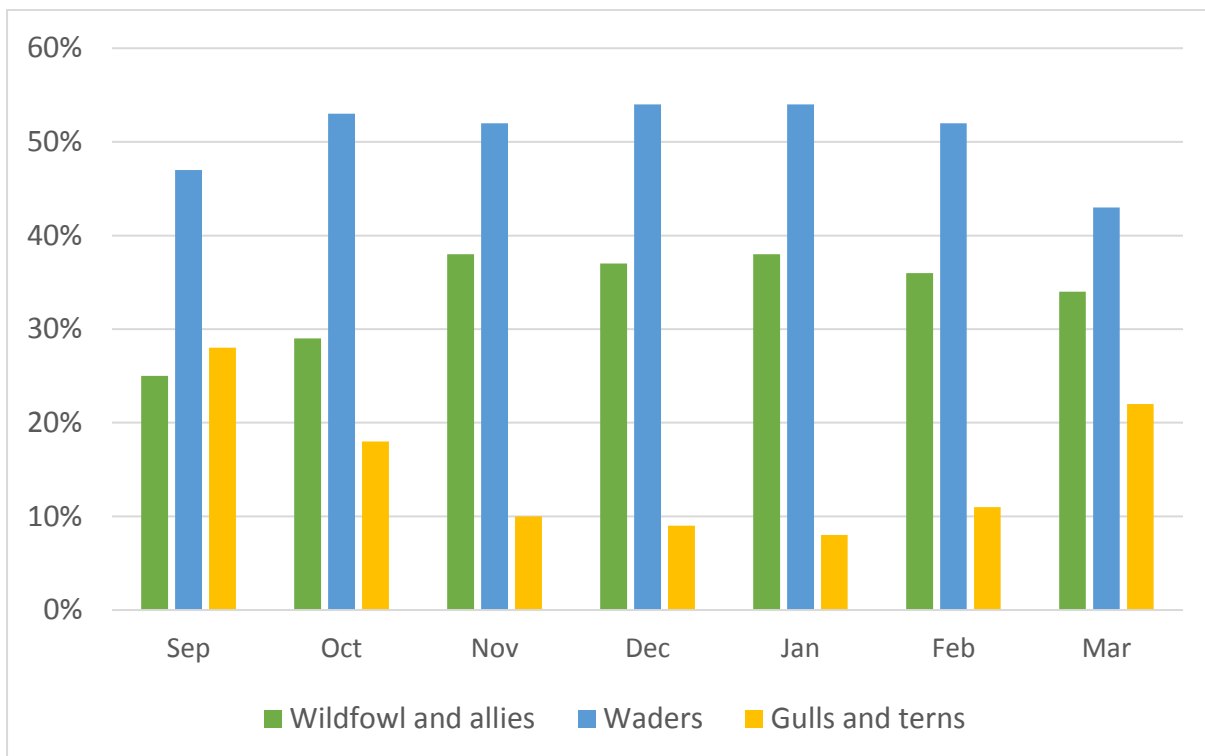
Species	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Mute Swan	2,290	2,363	3,406	3,821	3,489	2,394	1,535
Whooper Swan	8	569	3,345	3,941	4,307	2,300	998
Greenland White-fronted Goose		241	8,163	7,891	8,905	711	875
Greylag Goose	2,792	809	5,456	5,082	5,284	3,981	1,920
Canada Goose	199	397	556	33	139	9	18
Barnacle Goose		36	1,374	3,905	4,117	1,515	2,217
Light-bellied Brent Goose	22	3,958	13,760	13,109	12,837	7,800	6,946
Shelduck	134	513	4,473	6,148	6,410	5,114	3,118
Wigeon	1,353	8,771	23,118	37,976	41,504	27,855	9,980
Gadwall	75	59	189	441	330	276	121
Teal	1,981	3,307	9,101	16,958	23,671	15,785	6,738
Mallard	4,017	3,780	5,975	6,989	6,666	3,060	1,912
Pintail	6	59	740	893	1,450	997	147
Shoveler	40	191	695	1,458	2,767	1,211	733
Pochard	25	57	170	1,609	470	561	4
Tufted Duck	593	1,319	4,043	4,220	5,742	3,591	1,790
Scaup		88	23	65	86	3	1
Long-tailed Duck		3	25	22	52	16	4
Common Scoter	299	1,022	1,802	1,286	3,881	1,999	806
Goldeneye		47	427	548	548	347	192
Red-breasted Merganser	132	334	589	663	942	536	350
Red-throated Diver	31	68	178	120	160	92	39
Great Northern Diver	3	82	221	312	812	596	225
Little Grebe	675	514	681	904	949	542	170
Great Crested Grebe	314	419	431	740	702	492	238
Cormorant	1,530	1,977	2,323	2,979	2,691	1,366	859
Shag	191	416	455	394	1,120	414	127
Little Egret	484	613	590	390	272	243	118
Grey Heron	388	392	538	592	561	335	173
Water Rail	3	7	8	43	17	6	2
Moorhen	189	148	177	241	276	206	168
Coot	5,180	2,791	7,673	5,365	5,626	2,580	452
<b>Wildfowl Total*</b>	<b>22,964</b>	<b>35,752</b>	<b>100,980</b>	<b>129,434</b>	<b>147,015</b>	<b>87,128</b>	<b>43,162</b>
Oystercatcher	10,360	14,539	18,696	21,449	23,305	13,532	7,514
Ringed Plover	1,783	2,350	2,848	2,186	3,091	1,878	636
Golden Plover	167	10,757	28,153	54,751	45,602	23,189	4,765
Grey Plover	137	330	1,047	980	2,633	1,142	1,857
Lapwing	2,186	4,358	20,622	29,294	36,115	16,043	2,481
Knot	44	1,284	7,908	8,623	10,746	8,596	5,586
Sanderling	1,320	2,160	1,616	1,490	2,454	1,935	564

Species	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Purple Sandpiper			3	4	68	23	10
Dunlin	2,135	3,577	17,445	22,049	34,135	23,638	14,357
Ruff	21	29	33	16	34		5
Snipe	33	96	369	514	514	513	269
Black-tailed Godwit	10,685	6,549	12,013	19,314	14,822	11,634	4,543
Bar-tailed Godwit	1,674	1,947	4,563	6,822	4,865	5,702	3,127
Whimbrel	22	9	3	6	3	13	3
Curlew	5,825	7,248	8,730	9,553	13,466	11,189	3,179
Common Sandpiper	2	2	9	4	8	9	1
Greenshank	402	471	549	474	559	422	237
Redshank	7,868	9,726	11,885	9,202	11,212	8,137	4,552
Turnstone	486	837	1,157	1,014	1,612	1,024	514
<b>Waders Total*</b>	<b>45,157</b>	<b>66,290</b>	<b>137,663</b>	<b>187,906</b>	<b>205,250</b>	<b>128,625</b>	<b>54,212</b>
Mediterranean Gull	59	8	38	98	57	50	4
Black-headed Gull	13,949	10,595	15,195	11,894	16,199	14,601	11,602
Common Gull	2,739	2,779	3,928	3,366	5,236	4,909	4,744
Lesser Black-backed Gull	3,644	2,099	973	1,550	1,262	1,442	978
Herring Gull	4,397	6,034	5,211	14,060	5,685	5,637	9,457
Iceland Gull			1	16	16	14	22
Glaucous Gull					7	19	7
Great Black-backed Gull	1,087	1,435	998	1,161	1,205	1,020	911
Sandwich Tern	184	62	3	1		2	3
<b>Gulls &amp; Terns Total*</b>	<b>26,081</b>	<b>23,128</b>	<b>26,367</b>	<b>32,652</b>	<b>30,116</b>	<b>27,727</b>	<b>27,983</b>
Kingfisher	9	13	8	9	6	4	2
<b>Waterbirds Total*</b>	<b>94,211</b>	<b>125,183</b>	<b>265,018</b>	<b>350,001</b>	<b>382,387</b>	<b>243,484</b>	<b>125,359</b>

\* Totals include records of other waterbirds, including vagrant species listed in Table 4, feral or naturalised geese and ducks, as well as others that were not identified to species level (e.g. unidentified waders)



**Figure 3.** Percentage of the total numbers represented by the three main groups of waterbirds during winter 2016/17.



**Figure 4.** Percentage of the total numbers represented by the three main groups of waterbirds during winter 2017/18.

**Table 4.** Scarce species in 2016/17 (season 23) and 2017/18 (season 24). The peak count is indicated in brackets along with the season in which it was recorded.

Species	Latin name	Peak count (season)	Species	Latin name	Peak count (season)
Bewick's Swan	<i>Cygnus columbianus</i>	12 (S24)	Cattle Egret	<i>Bubulcus ibis</i>	17 (S23)
Black Swan	<i>Cygnus atratus</i>	5 (S23)	Great White Egret	<i>Ardea alba</i>	4 (S23)
Bean Goose	<i>Anser fabalis</i>	3 (S24)	Glossy Ibis	<i>Plegadis falcinellus</i>	7 (S24)
Pink-footed Goose	<i>Anser brachyrhynchus</i>	165 (S23)	Spoonbill	<i>Platalea leucorodia</i>	5 (S23)
Dark-Bellied Brent Goose	<i>Branta bernicla bernicla</i>	1 (S23)	Avocet	<i>Recurvirostra avosetta</i>	1 (S23)
Egyptian Goose	<i>Alopochen aegyptiacus</i>	3 (S23)	American Golden Plover	<i>Pluvialis dominica</i>	1 (S23)
Feral/hybrid Goose		306 (S23)	Semi-palmated Sandpiper	<i>Calidris pusilla</i>	1 (S23/S24)
Hybrid Shelduck	<i>Tadorna sp.</i>	2 (S23)	Little Stint	<i>Calidris minuta</i>	5 (S23)
Ruddy Shelduck	<i>Tadorna ferruginea</i>	5 (S23)	Pectoral Sandpiper	<i>Calidris melanotos</i>	1 (S23)
Mandarin	<i>Aix galericulata</i>	8 (S23)	Curlew Sandpiper	<i>Calidris ferruginea</i>	7 (S23)
American Wigeon	<i>Anas americana</i>	23 (S23)	Jack Snipe	<i>Lymnocyptes minimus</i>	17 (S24)
Green-winged Teal	<i>Anas carolinensis</i>	2 (S23)	Woodcock	<i>Scolopax rusticola</i>	3 (S24)
Feral/hybrid Mallard type		208 (S23)	Green Sandpiper	<i>Tringa ochropus</i>	4 (S23)
Fulvous Whistling duck	<i>Dendrocygna bicolor</i>	2 (S24)	Spotted Redshank	<i>Tringa erythropus</i>	7 (S23)
Ring-necked Duck	<i>Aythya collaris</i>	13 (S23)	Little Gull	<i>Larus minutus</i>	4 (S23)
Lesser Scaup	<i>Aythya affinis</i>	1 (S24)	Ring-billed Gull	<i>Larus delawarensis</i>	3 (S24)
Eider	<i>Somateria mollissima</i>	316 (S24)	Yellow-legged Gull	<i>Larus arg. Cachinnans michahellis</i>	1 (S23)
King Eider	<i>S. spectabilis</i>	1 (S24)	Unidentified gull	<i>Larus sp.</i>	45 (S23)
Surf Scoter	<i>Melanitta perspicillata</i>	2 (S24)	Roseate Tern	<i>Sterna dougallii</i>	10 (S23)
Velvet Scoter	<i>Melanitta fusca</i>	3 (S23)	Common Tern	<i>Sterna hirundo</i>	23 (S24)
Smew	<i>Mergellus albellus</i>	1 (S23)	Arctic Tern	<i>Sterna paradisaea</i>	8 (S23)
Goosander	<i>Mergus merganser</i>	11 (S24)	Common/ Arctic Tern	<i>Sterna sp.</i>	105 (S23)
Black-throated Diver	<i>Gavia arctica</i>	4 (S23/S24)	Forster's Tern	<i>Sterna forsteri</i>	1 (S23/S24)
Pacific Diver	<i>Gavia pacifica</i>	1 (S23)	Little Tern	<i>Sterna albifrons</i>	2 (S24)
Slavonian Grebe	<i>Podiceps auritus</i>	41 (S24)	Black Tern	<i>Chidonias niger</i>	1 (S24)
Black-necked Grebe	<i>Podiceps nigricollis</i>	2 (S23)			

## Principal sites

Based on counts between 2013/14 and 2017/18, 41 sites were identified to support wintering waterbird **species in numbers of international importance**; an increase on the 36 sites identified in the previous period (2011/12 – 2015/16) (Burke *et al.* 2018b) (Table 5). Sites with a five-year average of 20,000+ waterbirds were Dundalk Bay, Lough Swilly, Dublin Bay, Wexford Harbour & Slobbs and Cork Harbour (Table 5). Each of these sites also supported more than 20,000 waterbirds in the previous period (Burke *et al.* 2018b). Lough Foyle is monitored by UK WeBS and continues to support numbers in excess of this threshold; Frost *et al.* (2019) reported a mean of 32,581 for the period 2013/14 to 2017/18. In addition to the aforementioned sites, Little Brosna Callows, Rogerstown Estuary and Tacumshin Lake all supported peak numbers of waterbirds in excess of 20,000 during the five-year period examined, with means ranging from 13,874 to 17,722. Because of the large size and breadth of the site, it has been extremely difficult to achieve a sufficient level of survey coverage of the Shannon and Fergus Estuary throughout the life of I-WeBS. Recent survey coverage of the site in 2017/18 by McCarthy Keville O'Sullivan Ltd., under contract to Clare County Council, found that "More than 20,000 waterbirds occurred in all the months across the traditional winter counting period (September-March) with the numbers peaking at nearly 44,000 in December" (McCarthy Keville O'Sullivan 2019).

Compared to the previous reporting period, eight sites supported **concentrations of species in numbers of international importance**, having only supported numbers of national importance previously, namely: Lady's Island Lake, Lough Corrib, Lough Cullin, Lough Derg (Shannon), Lough Ennell, Lough Kinale & Derragh Lough, Lough Oughter Complex and Tacumshin Lake. In addition, three sites supported numbers of international importance that did not qualify for international or national listing during the former period, namely: Killybegs Harbour, Lough Ree and South East Clare Lakes. Each of these sites supported Mute Swan in numbers of international importance during the period examined. It should be noted that Irish Mute Swans are considered to form a closed population and the international threshold is therefore the same as the national threshold (Burke *et al.* 2018a). Most of these sites have held similarly important numbers of Mute Swans in the past and it seems their recent re-inclusion on the list of sites supporting internationally important numbers might relate in most cases to improved survey coverage over the period 2013/14 to 2017/18.

Seven sites no longer qualify as supporting numbers of international importance since the former period, namely: Ballymacoda Bay, Boyne Estuary, Clonakilty Bay, Courtmacsherry Bay, Broadstrand Bay & Dunworley, Hick's Tower & Robswall, the Shannon and Fergus Estuary and the Shannon Callows (aerial). Of those sites supporting numbers of international importance for one or more species, thirteen supported in excess of 10,000 waterbirds in total (five-year mean peak), compared to 17 sites during the former period (2011/12– 2015/16). As outlined above, I-WeBS coverage of the Shannon and Fergus Estuary is best described as minimal, sadly due to a lack of volunteer counters for this large site. Counts during the winter of 2017/18 season for the Shannon Integrated Framework Programme (SIFP) (McCarthy Keville O'Sullivan 2019) confirmed that 20,000 waterbirds were present across all winter months. The peak count of 43,093 waterbirds (December 2017) (McCarthy Keville O'Sullivan 2019) confirms that the Shannon & Fergus estuaries is the most important site in the Republic of Ireland in terms of total waterbird numbers.

Based on the mean of peak counts between 2013/14 and 2017/18, 93 sites were identified as supporting waterbirds in **numbers of national importance**, three fewer sites than during the previous reporting period (2011/12 – 2015/16) (Burke *et al.* 2018b) (Table 6). Some 19 sites supported nationally important concentrations of waterbirds for this period that were not listed during the former period, namely: An Trá Beg, Ballyness Bay, Cahermore Turlough, Cloonagh Lough (Mayo), Corofin Wetlands, Drumalough, Dublin Zoo Ponds, East Ballinamore Lakes, Kiltiernan Turlough, Knockaderry Reservoir, Lough Leane & Killarney Valley, Lough O'Grady, North East Galway Lakes, River Barrow (Cheekpoint-New Ross), River Suck, Rosslare (outer bay), The Lough (Cork), Trawbreaga Bay and Tullaghnafrankagh Lough.

In contrast, 15 sites that supported nationally important concentrations of waterbirds during the former period do not qualify for this listing during the current period. These are: Achill Island, Ballyconneely Bay, Ballycrenane/Warren, Buckrone Fen, Cabragh Wetlands, Castlemaine Outer: Inch offshore, Delvin River – Hampton Cove, Dunfanaghy Estuary, Kilkeran Lake, L. Coy - Blackrock - Bullaunagh – Ballylee, Lambay Island, River Deel, River Shannon Lower (aerial), River Slaney, River Suck (aerial) and Whiting Bay.

Of those sites that supported numbers of waterbirds of national importance, 29 supported in excess of 2,000 waterbirds total (five-year mean peak), compared to 33 sites during the former period 2011/12 – 2015/16.



**Table 5.** Sites supporting numbers of waterbirds of international and national importance based on counts between 2013/14 and 2017/18. Sites with mean peak annual count <2,000 are listed below the table. Species code in upper case = occurring in numbers of international importance; Species code in lower case = occurring in numbers of national importance. \* indicates count was not included in the five-year mean due to low count coverage of key subsites.

Site	2013/14	2014/15	2015/16	2016/17	2017/18	Mean	Species occurring in significant numbers
Dundalk Bay	49,477	38,117	39,595	59,483	40,129	45,360	BA, BW, KN, PB, ca, cu, cx, dn, et, gg, gj, gn, gp, gv, h., l., ma, nd, oc, pt, rk, rm, rp, su, t., tt, wn
Lough Swilly	28,507	36,719	32,748	36,129	32,707	33,362	GJ, MS, NW, PB, WS, ba, bw, ca, co, cu, dn, gg, gk, gn, gp, h., kn, l., lg, ma, nd, oc, rh, rk, rm, rp, ss, su, sv, t., tu, wn
Dublin Bay	31,427	31,595	27,601	37,304	36,016	32,789	BA, BW, PB, ca, cu, dn, et, gg, gk, gp, gv, h., kn, oc, pt, rk, rm, rp, ss, su, sv, t., tt, wn
Wexford Harbour & Slobbs	37,041	32,736	31,533	12,270*	29,062	32,593	BW, MS, NW, PB, WS, ba, ca, cu, dn, et, gg, gk, gn, gp, gv, kn, l., lg, ma, oc, pt, rk, rm, su, t., wn
Cork Harbour	20,050	25,066	19,850	14,952*	21,358	21,581	BW, ba, bw, ca, cu, dn, et, ga, gg, gk, gp, h., l., lg, ma, oc, pt, rk, rm, su, sv, t., wn
Little Brosna Callows	15,613	25,495	9,716	13,218	24,568	17,722	BW, MS, gp, l., nw, pt, sv, t., wn, ws
Rogerstown Estuary	10,976	15,976	21,368	17,815	14,594	16,146	PB, ba, bw, cu, dn, et, gj, gk, gp, gv, l., oc, ps, rk, rm, rp, su, sv, t., tt, wn
Dungarvan Harbour	16,378	15,624	16,328	15,868	14,341	15,708	BW, PB, ba, cu, dn, gg, gk, gp, gv, kn, l., oc, rk, rm, su, tt
Tacumshin Lake	10,170	10,282	14,154	21,256	13,510	13,874	MS, bw, co, cu, dn, et, ga, gj, gp, l., lg, pt, su, sv, t., wn, ws
Inner Galway Bay	14,305	12,491	10,206	14,822	14,644	13,294	ND, PB, ba, bw, ca, cu, dn, et, gg, gk, gp, gv, h., l., lg, rk, rm, rp, su, sv, t., tt, wn
Bannow Bay	12,618	12,445	7,705	14,728	11,090	11,717	PB, ba, cu, dn, et, gp, gv, kn, l., oc, rk, su
Rahasane Turlough	16,254	11,522	11,741	9,674	8,813	11,601	BW, gp, l., pt, sv, wn
Lough Corrib	12,481	14,279	774*	5,607	8,263	10,158	MS, co, gj, gp, lg, po, tu
Castlemaine Harbour & Rossbehy	9,347	11,114	8,999	14,382	4,815	9,731	PB, ba, dn, et, gk, ma, oc, pt, rk, ss, wn

Site	2013/14	2014/15	2015/16	2016/17	2017/18	Mean	Species occurring in significant numbers
Tralee Bay, Lough Gill & Akeragh Lough	8,866	8,638	10,377	14,762	4,191	9,367	MS, PB, ba, dn, gp, gv, pt, rp, sp, ss, tt, wn
Blacksod & Tullaghan Bays	12,840	8,305	7,247	9,101	7,941	9,087	ND, PB, RP, ba, by, cu, cx, dn, gj, gk, gv, rh, rm, ss
Tramore Back Strand	7,444	8,821	11,312	8,178	9,317	9,014	PB, ba, bw, cu, dn, ga, gp, gv, l., lg, oc, rk, su, sv
The Cull & Killag (Ballyteige)	6,569	11,895	8,701	7,734	6,371	8,254	PB, ba, bw, dn, et, gk, gp, gv, l., rk, t.
Donegal Bay	5,764	5,778	5,340	6,708	6,211	5,960	MS, ND, ca, cu, cx, e., gk, h., lg, oc, pb, rh, rm, rp, ss, ws
Drumcliff Bay Estuary	3,557	4,933	3,851	8,330	8,989	5,932	BY, ba, kn, oc, ss, su, t..
Broadmeadow (Malahide) Estuary	5,369	4,100	4,545	8,788	6,823	5,925	PB, bw, dn, et, gg, gk, gn, gv, kn, lg, oc, pb, rk, rm, su
Blackwater Estuary	5,632	3,529	8,896	4,374	4,562	5,399	BW, cu, et, gk, h., rk, su, wn
Lough Ree		7*	4,465	6,100		5,283	MS, co, gp, l.
Ballysadare Bay	4,715	5,039	4,734	4,436	4,911	4,767	PB, ba, cu, gk, rk, rm, rp, t., wn
Baldoyle Bay	6,459	3,994	4,095	4,516	3,352	4,483	PB, bw, gg, gp, kn
Sligo Harbour	4,303	4,398	3,974	4,472	4,528	4,335	PB, ba, cu, gk, kn, oc, rk, rm, ss
North Wicklow Coastal Marshes	4,846	2,655	4,106	3,222	6,120	4,190	PB, bw, et, gj, lg, rh, sv, t., wn
Killala Bay	3,791	5,627	3,415	3,790	2,864	3,897	PB, ba, dn, gv, kn, rk
Lady's Island Lake	3,604	2,909	2,986	4,065	4,708	3,654	MS, bw, co, et, ga, gj, gv, sv, wn
Lough Ennell	4,838	2,351	3,428	1,135*	2,344	3,240	MS, co, gv, lg, po
Termoncarragh & Annagh Marsh	2,943	2,177		3,155	3,339	2,904	BY, gj, rp

Site	2013/14	2014/15	2015/16	2016/17	2017/18	Mean	Species occurring in significant numbers
Lough Iron	1,898	1,926	2,820	1,765	2,173	2,116	NW, bs, nw, sv
Lough Cullin	1,640	2,667	1,367	2,357	1,179	1,842	MS, gn, tu
Lough Kinale & Derragh Lough	1,611	2,153	2,410	1,706	1,011	1,778	MS, co, gv, lg, tu
Dunfanaghy New Lake	1,615	1,519	1,600	1,806	2,288	1,766	BY, MS, nw
Lough Derg (Shannon)	3,497	2,244	983	921	1,126	1,754	MS, ca, gg, gj, lg, tu
Lough Oughter Complex	2,075	666		3,336	872	1,737	MS, tu
Lough Gara	1,821	2,544		591	1,903	1,715	MS, gj, tu, ws
South East Clare Lakes	1,133	1,142	1,034	1,070	799	1,036	MS, ga, gj, gn, lg
Killybegs Harbour				751		751	MS
Swellan Lough	309					309	MS

**Table 6.** Sites supporting numbers of waterbirds of national importance based on counts between 2013/14 and 2017/18.

Site	2013/14	2014/15	2015/16	2016/17	2017/18	Mean	Species occurring in significant numbers*
Ballymacoda		16,088		17,691	7,591*	16,890	ba, bw, cu, dn, et, gp, gv, rk, rp, ss, t., wn
Boyne Estuary	8,179	8,206	11,563	18,880	11,636	11,693	bw, cu, cx, dn, gp, gv, kn, l., oc, rk, ss, su, t.
Southern Roscommon Lakes	9,446	9,669	2,657	5,864	20,745	9,676	gp, gv, l., pt, sv, t., wn
Glenamaddy Turlough	7,716					7,716	gp, l., nw
Inishcarra Reservoirs	9,636	1,411	6,730	4,624	4,177	6,645	gj, gp, l., ma, t.
Clonakilty Bay	5,962	6,103	6,253	5,017	8,069	6,281	bw, cu, dn, et, gk, ma, rk, wn
River Barrow (Checkpoint-New Ross)				5,518	6,455	5,987	dn, gp
Ballycotton Shanagarry	6,158	6,218	5,993	4,062	4,370	5,360	cu, gp, gv, ss, t.
Courtmacsherry Bay, Broadstrand Bay & Dunworley	5,487	4,617	5,219	6,652	4,340	5,263	bw, cu, et, h., nd, su, sv, t., wn
River Suck		1,924	1,731	5,712	9,732	4,775	l., pt, sv, t., wn, ws
Nanny Estuary & shore	3,167	1,823	3,780	11,339	3,391	4,700	bw, cx, gp, kn, ss
Dunany Point - Clogher Head	1,128*		4,010	2,875	6,233	4,373	gp, kn, oc, rm
Lough Rea	3,679	3,905	4,018		3,055	3,664	co, po, sv
Derryoughter West			4,196	3,132		3,664	gp, ws
Clew Bay	3,174	3,181	3,700	4,582	3,323	3,592	cu, et, gk, h., lg, nd, rk, rm, rp
Lough Owel	4,284	4,142	1,903	3,579	3,821	3,546	co, gg, po, sv, tu
Boora Lakes - Back Lakes Finnamores	942		5,709			3,326	gp, l.
Cashen River & Estuary	2,837	3,400	5,647	2,288	2,380	3,310	ba, bw
Kildare Curragh			3,500	3,045		3,273	gp

Site	2013/14	2014/15	2015/16	2016/17	2017/18	Mean	Species occurring in significant numbers*
Rosscarbery	5,405	3,881	3,340	1,606	1,028	3,052	gp
Lough Sheelin	982	1,586	1,380	8,334	2,035	2,863	co, gg, lg, ms, po, tu
Corofin Wetlands	2,142	1,171	2,159	3,112	4,703	2,657	gj, sv, wn
Carlingford Lough (Rol)	1,318	2,950	2,687	3,419	2,505	2,576	ca, rk, tt
Dundalk Bay Outer (North: Ballagan Point - Giles Quay)	1,402	859*	2,171	5,114	1,472	2,540	ca, dn, rm
North Central Galway Lakes	1,567		4,251	1,799		2,539	sv, wn, ws
Ballyallia Lake	2,402	2,639	2,024	1,825	3,694	2,517	co, gj, lg, sv, wn
Shannon & Fergus Estuary	2,101	3,190	758	1,321	4,183	2,311	ga, gj, lg, sv
Lough Derravaragh	2,983	2,558	1,270	2,384	2,060	2,251	co, lg, po, tu
Shannon Callows		5,305	1,470	88	1,402	2,066	pt

**Other nationally important sites (mean and species):-** Skerries Islands (1,896) ca,cu,tt; Kiltiernan Turlough (1,878) gp; Rosslare (Outer Bay) (1,835) cx,gg,rh; Brandon Bay - Inner Brandon Bay (1,833) cx,ss; Castleplunket Turloughs (1,830) sv,wn,ws; Wexford Bay (1,714) cx,rh; South Mayo Coast (1,646) rp,ss; Skerries Coast (1,584) rp,ss,tt; Ballybackagh (1,583) gj; Mid-Clare Coast (Mal Bay - Doonbeg Bay) (1,533) ps,rp,ss,tt; Lough Gowna (1,527) gg,lg,ms; River Shannon (Lower) (1,507) lg,tu; Bandon Estuary (1,419) bw,et,gk,rk; Trawbreaga Bay (1,346) by; Cahermore Turlough (1,336) wn; Kilglassan Turlough/ Greaghans (1,320) gj,sv; Lough Mask (1,173) gn,lg,tu; Rostaff Lake (1,105) sv; Stick Estuary (Oysterhaven) (1,090) bw; Waterford Harbour (1,049) gg; Kilcolman Marsh (1,043) sv,t.; Blackwater Callows (971) bw; Annaghmore Lakes (936) sv; Ballinamore Lakes (936) gn,tu; Broadhaven & Sruwadacon Bays (925) nd,rm; North East Galway Lakes (910) sv; Inishmore, Aran Islands (844) ss; Poulaphouca Reservoir (832) gj; Ireland's Eye (809) ca,tt; Lough Leane & Killarney Valley (805) ga; Doolough Headford (Turloughcor) (789) ga,sv; Mullet West (732) by; Charleville Lagoons (728) sv; Ballyness Bay (720) by; River Suir Lower (638) gj; Omey Strand (629) rp,ss; Dublin Zoo Ponds (600) tu; Termon Turloughs (594) gj,gv,lg; Pat Reddan's Lake (589) ga,sv; East Ballinamore Lakes (556) ms; Ventry Harbour (537) rp; Magharees Islands (481) ss; Marlfield Lake (480) ga,lg,sv; Lough Eorna (445) lg; Lough O'Grady (418) gj; Mannin Bay (411) rp; Lough Aderry (396) ga; An Trá Beg (385) gk; Drumalough (371) gj; Lough Arrow (338) lg; Carrowmore Beach (294) ss; Blarney Lake (278) ga; Knock Lake (248) lg; Grand Canal (Dublin) (239) ms; Lough Carra (228) gn; Little Brosna Callows (aerial) (171) nw; Lough Glore (120) lg; Tullaghnafrankagh Lough (118) sv; Cloonagh Lough (Mayo) (98) ms; Knockaderry Reservoir (89) lg; The Lough Cork (55) sv,z

## Discussion

Count coverage during both the 2016/17 (271 sites) and 2017/18 (250) seasons compares favourably to previous years (234 sites in 2015/16, 261 in 2014/15), with the majority (68%) of key sites covered in three or more months.

Winter 2016/17 was both mild and dry, with a high pressure system through most of December and January. All weather stations reported rainfall below the long-term average, often only half or three-quarters the norm, and all seasonal mean temperatures were above their long-term average (Met Éireann 2017). Winter 2017/18, by comparison, was considered 'average', with much unsettled weather through the season including heavy rainfall in December and January, and a cold spell (namely 'the Beast from the East') in late February and early March (Met Éireann 2018).

Maximum numbers of waterbirds were recorded in January of both seasons, as is generally the case, likely due to a combination of a true peak in waterbirds visiting Ireland, as well as the increased site and subsite coverage that month. These maxima were reflected in the totals of each of the species groups, namely wildfowl and allies, waders and gulls and terns. The peak count of >432,000 waterbirds in January 2017 was particularly high, although should be interpreted in the context of high levels of survey coverage that month. The mild and dry conditions may have reduced the number of sites and usually subsites available to waterbirds mid-winter and resulted in greater concentrations at fewer sites instead.

The ratios of different species groups were similar to previous years, with 50-58% of waterbirds recorded mid-winter (Nov-Feb) comprising of waders, followed by 33-40% wildfowl and allies and 9-12% gulls and terns. The numbers of species were largely in line with their recently-calculated population estimates (Burke *et al.* 2018a), with Golden Plover, Dunlin and Lapwing the most numerous waders and Wigeon, Teal and Brent Goose the most numerous wildfowl. The peak count of 70,726 Golden Plover in January 2017 was almost 90% of the population estimate for the Republic of Ireland and this particularly high count was one of the reasons for elevated total waterbird numbers that season. The following season, the 19,314 Black-tailed Godwits recorded in December 2017 is 8% higher than the recent population estimate (2011/12-15/16), indicating a continued population increase for this species (Burke *et al.* 2018a).

Five sites continue to support over 20,000 waterbirds each year (mean of annual peak), but the number of sites supporting in excess of 10,000 waterbirds has declined by five (from 17 to 13) since the 2011/12-2015/16 period. The number of sites supporting numbers of individual wintering



waterbird species of international importance has increased by five since the last assessment (41 compared to 36), largely due to improved coverage in the five-year period examined producing mean Mute Swan counts above the national/international threshold. Three fewer sites supported numbers of national importance compared to the 2011/12-2015/16 period and importantly the number of those sites supporting 2,000+ waterbirds each winter fell by four sites. However, it should be borne in mind that the national 1% thresholds used here are different to those in previous annual I-WeBS reports, based on the recent updating of population estimates (Burke *et al.* 2018a). Many of these sites are amongst those most frequently and comprehensively monitored each year, and although annual variation in weather can influence waterbird distribution in the short-term, the declining trends in a large number of wildfowl and wader species outlined in Burke *et al.* (2018a) and Lewis *et al.* (2019) remain cause for serious concern. Burke *et al.* (2018a) highlighted that 15 sites in the Republic of Ireland supported more than 20,000 migratory waterbirds on annual basis in 2004/05, which has gradually declined to the five sites that still meet that threshold today.

The value of I-WeBS continues to be shown in demonstrating the importance of many of our wetland sites, and the production of short- and long-term trends for the majority of our waterbird species, particularly those of conservation concern, as outlined in the recently-published 'Irish Wildlife Manual' (Lewis *et al.* 2019). 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 additional species-specific surveys such as the Post-breeding Tern Survey (Burke *et al.* 2020a) and annual monitoring of Greylag and Pink-footed Geese (Burke *et al.* 2020b) 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 1

**Table A1.** 1% National and International thresholds for wintering waterbirds in Ireland, from Burke *et al.* 2018a.

Code	Species	1% national	1% international
<b>Wildfowl &amp; Allies</b>			
<b>MS</b>	Mute Swan	90	100
<b>BS</b>	Bewick's Swan	20	220
<b>WS</b>	Whooper Swan	150	340
<b>NW</b>	Greenland White-fronted Goose	100	190
<b>GJ</b>	Greylag Goose	35	980
<b>BY</b>	Barnacle Goose	160	810
<b>PB</b>	Light-bellied Brent Goose	350	400
<b>SU</b>	Shelduck	100	2,500
<b>WN</b>	Wigeon	560	14,000
<b>GA</b>	Gadwall	20	1,200
<b>T.</b>	Teal	360	5,000
<b>MA</b>	Mallard	280	53,000
<b>PT</b>	Pintail	20	600
<b>SV</b>	Shoveler	20	650
<b>PO</b>	Pochard	110	2,000
<b>TU</b>	Tufted Duck	270	8,900
<b>SP</b>	Scaup	25	3,100
<b>E.</b>	Eider	55	9,800
<b>CX</b>	Common Scoter	110	7,500
<b>GN</b>	Goldeneye	40	11,400
<b>RM</b>	Red-breasted Merganser	25	860
<b>RH</b>	Red-throated Diver	20	3,000
<b>ND</b>	Great Northern Diver	20	50
<b>LG</b>	Little Grebe	20	4,700
<b>GG</b>	Great Crested Grebe	30	6,300
<b>CA</b>	Cormorant	110	1,200
<b>ET</b>	Little Egret	20	1,100
<b>H.</b>	Grey Heron	25	5,000
<b>CO</b>	Coot	190	15,500
<b>Waders</b>			
<b>OC</b>	Oystercatcher	610	8,200
<b>RP</b>	Ringed Plover	120	540
<b>GP</b>	Golden Plover	920	9,300
<b>GV</b>	Grey Plover	30	2,000
<b>L.</b>	Lapwing	850	72,300
<b>KN</b>	Knot	160	5,300
<b>SS</b>	Sanderling	85	2,000

Code	Species	1% national	1% international
<b>PS</b>	Purple Sandpiper	20	110
<b>DN</b>	Dunlin	460	13,300
<b>BW</b>	Black-tailed Godwit	200	1,100
<b>BA</b>	Bar-tailed Godwit	170	1,500
<b>CU</b>	Curlew	350	7,600
<b>GK</b>	Greenshank	20	3,300
<b>RK</b>	Redshank	240	2,400
<b>TT</b>	Turnstone	95	1,400

## Appendix 2

**Table A2.** Common and Latin names of regularly-occurring wintering waterbird species in Ireland in 2016/17 and 2017/18.

Common name	Latin name	Common name	Latin name
<b>Wildfowl &amp; Allies</b>			
Mute Swan	<i>Cygnus olor</i>	Scaup	<i>Aythya marila</i>
Whooper Swan	<i>Cygnus cygnus</i>	Long-tailed Duck	<i>Clangula hyemalis</i>
Greenland White-fronted Goose	<i>Anser albifrons flavirostris</i>	Common Scoter	<i>Melanitta nigra</i>
Greylag Goose	<i>Anser anser</i>	Goldeneye	<i>Bucephala clangula</i>
Canada Goose	<i>Branta canadensis</i>	Red-breasted Merganser	<i>Mergus serrator</i>
Barnacle Goose	<i>Branta leucopsis</i>	Red-throated Diver	<i>Gavia stellata</i>
Light-bellied Brent Goose	<i>Branta bernicla hrota</i>	Great Northern Diver	<i>Gavia immer</i>
Shelduck	<i>Tadorna tadorna</i>	Little Grebe	<i>Tachybaptus ruficollis</i>
Wigeon	<i>Anas penelope</i>	Great Crested Grebe	<i>Podiceps cristatus</i>
Gadwall	<i>Anas strepera</i>	Cormorant	<i>Phalacrocorax carbo</i>
Teal	<i>Anas crecca</i>	Shag	<i>Phalacrocorax aristotelis</i>
Mallard	<i>Anas platyrhynchos</i>	Little Egret	<i>Egretta garzetta</i>
Pintail	<i>Anas acuta</i>	Grey Heron	<i>Ardea cinerea</i>
Shoveler	<i>Anas clypeata</i>	Water Rail	<i>Rallus aquaticus</i>
Pochard	<i>Aythya ferina</i>	Moorhen	<i>Gallinula chloropus</i>
Tufted Duck	<i>Aythya fuligula</i>	Coot	<i>Fulica atra</i>
<b>Waders</b>			
Oystercatcher	<i>Haematopus ostralegus</i>	Snipe	<i>Gallinago gallinago</i>
Ringed Plover	<i>Charadrius hiaticula</i>	Black-tailed Godwit	<i>Limosa limosa</i>
Golden Plover	<i>Pluvialis apricaria</i>	Bar-tailed Godwit	<i>Limosa lapponica</i>
Grey Plover	<i>Pluvialis squatarola</i>	Whimbrel	<i>Numenius phaeopus</i>
Lapwing	<i>Vanellus vanellus</i>	Curlew	<i>Numenius arquata</i>
Knot	<i>Calidris canutus</i>	Common Sandpiper	<i>Actitis hypoleucos</i>
Sanderling	<i>Calidris alba</i>	Greenshank	<i>Tringa nebularia</i>
Purple Sandpiper	<i>Calidris maritima</i>	Redshank	<i>Tringa totanus</i>
Dunlin	<i>Calidris alpina</i>	Turnstone	<i>Arenaria interpres</i>
Ruff	<i>Philomachus pugnax</i>		
<b>Gulls &amp; Terns</b>			
Mediterranean Gull	<i>Larus melanocephalus</i>	Iceland Gull	<i>Larus glaucoideus</i>
Black-headed Gull	<i>Chroicocephalus ridibundus</i>	Glaucous Gull	<i>Larus hyperboreus</i>
Common Gull	<i>Larus canus</i>	Great Black-backed Gull	<i>Larus marinus</i>
Lesser Black-backed Gull	<i>Larus fuscus</i>	Sandwich Tern	<i>Sterna sandvicensis</i>
Herring Gull	<i>Larus argentatus</i>		
<b>Other Species</b>			
Kingfisher	<i>Alcedo atthis</i>		