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IRISH WETLAND BIRD SURVEY: WATERBIRD STATUS AND DISTRIBUTION 2009/10 – 2015/16

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An Roinn Cultúir, Oidhreachta agus Gaeltachta
Department of Culture, Heritage and the Gaeltacht

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Main photograph: **Light-bellied Brent Goose** *Branta bernicla hrota,* Brian Burke.

Irish Wetland Bird Survey: Waterbird Status and Distribution 2009/10 – 2015/16

Lesley Lewis, Brian Burke, Niamh Fitzgerald, David Tierney and Séan Kelly

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Executive Summary

Annual monitoring of the distribution and abundance wintering waterbirds is carried out in the Republic of Ireland by the Irish Wetland Bird Survey (I-WeBS). This monitoring programme, which commenced during the 1994/95 season, is funded by the National Parks and Wildlife Service and coordinated by the I-WeBS Office based at BirdWatch Ireland. I-WeBS monitors coastal wetland sites together with inland lakes, turloughs, rivers and callows. As I-WeBS is unsuitable for monitoring some waterbird habitats (e.g. non-estuarine coastline), data from the Non-estuarine Coastal Waterbird Survey (NEWS) and a number of species-specific surveys were integrated with I-WeBS data to estimate national population size and trends for a range of waterbird species. I-WeBS, together with these other surveys, therefore provides the principal tool used in the monitoring and conservation of wintering waterbird populations in Ireland and the wetlands upon which they rely. Importantly these data underpin reporting under Article 12 of the EU Birds Directive and thus for monitoring and assessing the efficacy of the Directive for the conservation of birdlife on a national and European scale.

This report provides a single comprehensive account on the current population status of wintering waterbirds and their key sites in the Republic of Ireland for the period 2009/10 – 2015/16. A total of 694 sites were surveyed, 345 of which were covered in three or more seasons. Detailed accounts are provided for 72 regularly-occurring waterbird species; comprising 40 species within the 'wildfowl and allies' category (swans, geese, ducks, and their allies), 22 wading bird species, and 10 gull species. For each regularly-occurring waterbird species, a national (and all-Ireland) population estimate is provided. Furthermore, it was possible to calculate population trends for 34 of these species. Summary data are provided for an additional 63 non-regularly-occurring waterbird species.

The total number of waterbirds wintering in Ireland was estimated at 757,910 waterbirds for the period 2011/12 – 2015/16, which represents a 15% decline since the period 2006/07 – 2010/11. Of the 19 wildfowl and ally species that were assessed, 17 species are showing declining trends over the recent five year period, with Scaup showing the greatest decline (>80%). Over the recent 22-year period, three species (Goldeneye, Pochard and Scaup) have declined by >50% and a further seven species have declined by 25–50% (Mallard, Pintail, Red-breasted Merganser, Shoveler, Tufted Duck and Wigeon). Conversely, Little Egret and Gadwall have increased by >50% over the 22-year period, and Grey Heron and Little Grebe have increased by 25–50%. Light-bellied Brent and Barnacle geese populations have increased in the long-term but shown population declines in the short term. Greenland White-fronted Goose, Icelandic Greylag Goose and Bewick Swan populations show continued declines while Whooper Swan have increased across all time periods assessed.

Nine of the 10 wader species assessed are showing declining trends over the recent five year period, with Knot showing the greatest decline (48%). Four wader species have declined by >50% over the 22-year period (Dunlin, Grey Plover, Lapwing and Purple Sandpiper), while three others (Black-tailed Godwit, Greenshank and Sanderling) have increased by >50% during the same period. It was not possible to calculate population trends for gull species.

Population data were also used to calculate thresholds relating to site importance at both the national and international (flyway) level. A total of 47 sites supported numbers of international importance and a further 85 sites supported numbers of national importance. Cork Harbour, Dublin Bay, Dundalk Bay, Lough Swilly, and Wexford Harbour and Slobs each supported over 20,000 wintering waterbirds, a criteria under the Ramsar Convention used to identify sites of international importance.

This report also includes an assessment of the current pressures and predicted future threats facing Ireland's wintering waterbirds. Based on this assessment, the most significant pressures and threats are: climate change, energy production (e.g. wind farms), hunting, recreational and other disturbance, shellfish harvesting and aquaculture, as well as afforestation, bycatch, and mixed source water pollution/eutrophication. A synthesis of these pressures and threats is included, highlighting information gaps where applicable.

Acknowledgements

This report is the product of tens of thousands of hours work by a large number of committed observers across the country, comprised primarily of volunteers, as well as professional conservation staff of the National Parks and Wildlife Service and BirdWatch Ireland. The success of I-WeBS is owed to the hard work, passion, and time they devote to monitoring Ireland's wintering waterbirds in their local areas, which ultimately allows us to know what is happening at both local and national level. This publication is therefore dedicated to every waterbird counter, both current and past, that has contributed to the Irish Wetland Bird Survey (I-WeBS) and additional waterbird surveys across the island of Ireland. Each valued counter is listed in Appendix 1. The resulting waterbird databases are an outstanding resource. The National Parks and Wildlife Service and BirdWatch Ireland are extremely grateful and proud to lead on publishing this latest report on the status and distribution of Ireland waterbirds, especially in the 25th Anniversary season of I-WeBS.

We are grateful to the British Trust for Ornithology (BTO) for providing data for the two cross-border sites, Lough Foyle and Carlingford Lough. We thank the Irish Brent Goose Research Group (Graham McElwaine & Kendrew Colhoun), the Irish Whooper Swan Study Group (Graham McElwaine) and the Greenland White-fronted Goose Study Group (Alyn Walsh) for data and input. The Irish Air Corps provided pilots and aircraft for aerial censuses. Additional special thanks go to the various people who kindly provided photographs to accompany the species accounts, and to Olivia Crowe and Helen Boland for their advice and input throughout.

1 Introduction

Overwintering waterbirds are one of the most conspicuous and numerous elements of the Irish avifauna. Ireland has an abundance of wetlands, both coastal and inland, and while these are biodiversity-rich habitats year-round, numbers of birds surge at these wetlands each autumn with the arrival of migratory waterbirds. The majority of species that occur in Ireland migrate from breeding grounds in the north and north-west (principally Canada, Greenland and Iceland) or from the north-east (Scotland and northern continental Europe, including Scandinavia, Russia and Siberia) (Wetlands International, 2012). Ireland's geographic position places it along an important migratory route – the East Atlantic Flyway – with birds travelling from northern breeding grounds to Ireland and to other important wintering areas farther south. Ireland's relatively mild climate, moderated by the influences of the Atlantic Ocean and Gulf Stream, together with its diversity and abundance of productive wetland habitats, make it particularly attractive for wintering waterbirds, especially when other parts of northwest Europe are frozen over. While many waterbirds remain in Ireland for the duration of the winter, others occur on passage before migrating further south.

The importance of Ireland's wetlands for wintering waterbirds has long been recognised due to early national surveys undertaken during the 1970s (Hutchinson, 1979) and repeated during the 1980s (Sheppard, 1993). In 1994/95, the Irish Wetland Bird Survey (I-WeBS) was initiated. It is funded by the National Parks and Wildlife Service and coordinated by the I-WeBS Office based at BirdWatch Ireland. 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. I-WeBS runs in parallel with the UK Wetland Bird Survey (WeBS), which covers Britain and Northern Ireland.

I-WeBS monitors coastal wetland sites together with inland lakes, turloughs, rivers and callows. However, the survey methods are unsuitable for some waterbird species that utilise other habitats, such as non-wetland habitat (e.g. terrestrial grassland), non-estuarine coastline, small and ephemeral wetlands, and the open sea; the latter of which is difficult to monitor from land-based surveys. Consequently, a number of additional, taxa-specific surveys are conducted on an annual or multi-annual basis for Bewick's Swan *Cygnus columbianus bewickii*, Whooper Swan *Cygnus cygnus*, Barnacle Goose *Branta leucopsis*, Icelandic Greylag Goose *Anser anser*, Greenland White-fronted Goose *Anser albifrons flavirostris* and Light-bellied Brent Goose *Branta bernicla hrota*. These surveys are coordinated largely by specialist working groups and better account for the number and relative abundance of these species, than I-WeBS data alone. In addition, the Non-estuarine Coastal Waterbird Survey (NEWS) is undertaken approximately every nine years and provides data on the abundance and distribution of waterbirds along non-estuarine coasts not monitored during I-WeBS counts, and particularly important for species such as Ringed Plover *Charadrius hiaticula*, Sanderling *Calidris alba*, Purple Sandpiper *Calidris maritima* and Turnstone *Arenaria interpres*.

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. 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 the targeted surveys, therefore provide the principal tools used in the conservation of wintering waterbird populations in Ireland and the wetlands that they rely upon.

This report provides a summary of wintering waterbird data collected from 2009/10 to 2015/16 inclusive, following on from earlier reports (Delany, 1996, 1997, Colhoun, 1999, 2000, 2001a, 2001b, Crowe, 2005, and Boland & Crowe, 2012). Overviews of results for all seasons covered by this report are presented elsewhere (Crowe *et al*., 2011, 2012b; Boland *et al*., 2014; Crowe *et al*., 2016; Lewis *et al*., 2016; Lewis *et al*., 2017b; and Burke *et al*., 2018a). However, this report, while combining information

on site assessment and waterbird numbers and trends, aims to provide a single comprehensive account on the current status of waterbirds and their key sites in the Republic of Ireland.

2 Methods

2.1 Waterbirds covered by the scheme

The term 'waterbirds' is defined as birds that are ecologically dependent on wetlands (Ramsar Convention, 1971) and is synonymous with *waterfowl* (Wetlands International, 2012). A waterbird population is a distinct assemblage of individuals of a species, where there is little immigration or emigration, occasionally resulting in a definitive gene pattern and thus recognition as a unique species or subspecies. There is often overlap of populations at some stage of the annual life-cycle, but most species tend to remain isolated in their flyways (Wetlands International, 2006). For the purposes of this report, the term *waterbird* includes species in the families Anatidae (swans, geese and ducks), Gaviidae (divers), Podicipedidae (grebes), Rallidae (Water Rail *Rallus aquaticus*, Moorhen *Gallinula chloropus* and Coot *Fulica atra*), Haematopodidae (oystercatchers), Charadriidae (plovers, lapwings), Scolopacidae (sandpipers, curlews, woodcocks, phalaropes) and Laridae (gulls and terns, excluding Kittiwake *Rissa tridactyla*). It also includes Cormorant *Phalacrocorax carbo*, Shag *Phalacrocorax aristotelis*, Little Egret *Egretta garzetta*, Grey Heron *Ardea cinerea* and Kingfisher *Alcedo atthis* (with no species account provided for the latter). While counts of gulls and terns are optional under I-WeBS, they are encouraged.

Note: the taxonomy and nomenclature followed in this report follows that of the *List of birds of the European Union* (EU Commission, 2018), as per reporting requirements under Article 12 of the Birds Directive for the period 2013-2018.

2.2 The Core Count Scheme

I-WeBS counts are undertaken by a network of skilled amateur ornithologists and professional staff of the partner organisations. Large sites require a team of counters and participants are encouraged to try to coordinate counts of adjacent sites between which waterbird movements are likely to occur, hence the scheme is facilitated on a local basis by voluntary Local Coordinators.

Counts conducted for I-WeBS are known as core counts, and are undertaken once per month between September and March inclusive. Count dates are pre-determined in order to maximise coordination of counts across the entire country, and thereby minimise duplication. While counts are recommended in all seven months, this is not always achieved so emphasis is put on achieving monthly counts during the mid-winter period of November to February when waterbird numbers of most species reach their peak. Counters are particularly encouraged to undertake counts in January as these totals contribute to the International Waterbird Census each year, coordinated by Wetlands International.

It is recommended that counts are conducted over a short time period (up to three hours) on recommended dates, or on the nearest appropriate date, and that there is at least a three week gap between successive count dates. This flexibility is important to allow for local conditions such as counter availability and weather conditions. Further, it is recommended that counts of coastal sites be carried out at or near high tide. For these reasons, dates on mid-month weekends with high tides as close to midday as possible are usually selected and, 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 inland sites.

Occasionally, extra counts within some months are submitted for a site. In this situation, the count that was conducted on or near the pre-determined date is selected as a core count, and all others are thereafter referred to as duplicate counts.

2.3 Count 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) which involves counters recording the number of individuals of each waterbird species within their defined count area during each monthly survey.

Large sites are subdivided into smaller count units (subsites) to facilitate coverage by an individual or small group of counters. 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. Data for each count unit covered are submitted separately on specially designed forms, or are submitted on-line.

In addition to ground-based core counts, aerial surveys are sometimes undertaken to facilitate coverage of large and inaccessible sites over a short period of time (usually less than two hours per site). Five sites have been covered by aerial survey between November and January on a regular seasonal basis: the Shannon and Fergus Estuary, Lough Derg, Shannon Callows, Little Brosna Callows and River Suck Callows. Lough Ree is included occasionally. Aerial surveys have some limitations however. For example, while all birds may be seen, the accuracy of counts is sacrificed due to the difficulties with identification of the smaller and more scattered species, along with the necessity to provide rapid estimates, particularly where large mixed flocks are concerned.

2.4 Additional related surveys

I-WeBS monitors the larger coastal wetland sites together with inland lakes, turloughs, rivers and callows. However, the resulting dataset is incomplete for some waterbird species that utilise other habitats, such as non-wetland habitat (e.g. grassland used by many species, particularly foraging geese and swans), non-estuarine coastline, small and ephemeral wetlands, and the open sea; the latter of which is obviously difficult to monitor from land-based surveys (Crowe, 2005). Accordingly, a number of additional, taxa-specific surveys are conducted on an annual or multi-annual basis. These include:

International Migratory Swan Census: Coordinated international censuses of the two migratory swan species that winter in Ireland, Bewick's Swan and Whooper Swan, have been organised at four or five-yearly intervals since 1986. This census is carried out over one weekend in January, which usually coincides with the dates chosen for the mid-winter International Waterbird Census. Counts in the Republic of Ireland are organised under the auspices of I-WeBS and the Irish Whooper Swan Study Group (IWSSG).

International Census of Greenland Barnacle Goose: Separate aerial surveys of wintering Barnacle Goose from the north-east Greenland breeding population have been conducted in spring (late March/ early April) every four to five years, since 1956/57. These geese predominantly overwinter on offshore and nearshore islands along the west coast of Ireland. A few regularly-used mainland sites are usually ground-counted simultaneously.

Icelandic breeding Goose Census: All sites known to support Icelandic Greylag Goose are surveyed annually over one weekend in November. Known feral flocks are not included in associated population estimates. From November 2018, Pink-footed Goose was included as a target species in this survey in the Republic of Ireland.

Greenland White-fronted Goose Census: This species is concentrated at relatively few sites during the winter and as many are non-wetland sites, this species is not well monitored using I-WeBS counts alone. Annual censuses of Greenland White-fronted Goose are carried out in Ireland and Britain during spring and autumn each season by NPWS Staff and members of the Greenland White-fronted Goose Study Group.

All-Ireland Light-bellied Brent Goose Census: Special surveys of Light-bellied Brent Goose (from the high arctic, north-east Canadian breeding population) have been in operation since 1996, with winter counts in Ireland going back to 1960. These are organised by the Irish Brent Goose Research Group (IBGRG). Currently, annual surveys are carried out at all well-known sites.

Non-estuarine Coastal Waterbird Survey (NEWS): Very few tracts of open coastline are surveyed during core counts, largely due to manpower constraints. Several waterbird species, particularly those that use sandy, shingle and rocky shore substrates or inshore waters, are therefore poorly censused. The first thorough non-estuarine waterbird census was conducted in the Republic of Ireland during the 1997/98 season (Colhoun & Newton 2000), a second census was carried out during 2006/07 (Crowe *et al.*, 2012a) and a third during the 2015/16 season (Lewis *et al*., 2017a).

Special census data have been included in this report where appropriate, and the sources of these data are gratefully acknowledged.

2.5 Data analyses and interpretation

This report presents individual species accounts for all regularly-occurring waterbird species recorded in the Republic of Ireland during winter. This report follows on from the previously reported period (2001/02 – 2008/09) (Boland & Crowe, 2012), in that site assessment data are provided for the period 2009/10 – 2015/16, although summary data (e.g. means and peaks) relate to the 'current period' defined as the recent five-year period 2011/12 – 2015/16. For waterbird species, 'regular' is defined here as a species that occurred at a site in five out of the seven seasons assessed (i.e. between 2009/10 – 2015/16). Various levels of data are presented and the following sections provide information as to how these data were compiled.

2.5.1 Waterbird population estimates

Obtaining estimates of the total number of waterbirds that winter in Ireland is important for a number of reasons. In addition to the scientific requirement to obtain such estimates and understand how numbers may change over time (see 'trends' section below), as a member of the European Union and signatory to EU Directive 2009/147/EC (the 'Birds Directive'), Ireland is obliged to monitor its waterbirds and provide for their conservation. As a consequence, population estimates based on I-WeBS and other data are an important component of Ireland's reporting process (Article 12) to Europe.

Burke *et al*. (2018b) provide updated population estimates for a total of 44 waterbird species, based on calculations of I-WeBS data together with data from more targeted surveys (e.g. goose and swan species censuses). All-Ireland estimates were calculated using a five-year mean for the period 2011/12-2015/16; consistent with the approach used previously in Ireland (e.g. Crowe & Holt, 2013; Crowe *et al*., 2008) and also consistent with the current data period reported here. Full details describing the analysis and modelling procedures can be found in Burke *et al*. (2018b). Note that population estimates are not generated for species that are currently not monitored adequately by I-WeBS methodology. These include species that can occur considerable distances offshore, such as the divers and seaducks, skulking species such as Moorhen, Water Rail and Snipe, and gulls which are not routinely counted.

2.5.2 Trends and annual indices

As the same sites are not necessarily covered by I-WeBS in all months and seasons, relative changes in waterbird numbers cannot be determined simply by comparing the total number of birds counted each season. Statistical modelling techniques have therefore been developed that enable relative changes in numbers to be estimated from incomplete datasets.

The first stage in the analysis was therefore to produce a modelled (imputed) count estimate where counts for a given month were missing or where a count was flagged as poor quality (e.g. due to poor visibility). To minimise the level of imputation and improve the overall analysis, only sites which had good count coverage (i.e. over 50% of occasions across the entire period) were included (after Underhill & Prŷs-Jones, 1994). The Underhill Index (Underhill & Prŷs-Jones, 1994) modelling approach was used to impute missing/poor quality counts, which uses a multiplicative log-linear index model with site, year and month factors (Underhill & Prŷs-Jones, 1994). The resulting dataset for the subset of sites was therefore complete for all months and seasons and comprised a combination of actual count data and imputed count data. For each species, counts were then summed over all months and over all sites to provide a season total. The season counts were then indexed by constraining the value for the first season (1994/95) to 1, and totals for all other seasons were expressed relative to this baseline. It is important to assess population trends using data that represents the period when the population was at its most stable. For all species other than wading birds, season totals are calculated by summing all monthly data between September and March. For wading birds, season totals were constrained to the months November to February.

The mean annual change was then expressed for each species as the slope of a line of best fit through the log of indices. However this method does not provide any details on the pattern of change (i.e. direction, magnitude or timing). Therefore the annual indices were modelled using a Generalised Additive Model (GAM). GAMs are non-parametric and flexible extensions of the generalised linear model which fit a smoothed trend to the annual indices. Count data were assumed to follow independent Poisson distribution with 0.3T degrees of freedom (e.g. after Atkinson *et al*., 2006). The resulting smoothed count data were then indexed as above. The GAM methodology and resultant smoothed indices allow for the calculation of proportional change in population size between one season and another, and this method was used to calculate the trend values reported, namely the 5-year change, 12-year change, and 22-year change, which is the percentage change in population size across the specified time period using:

$$\text{Change} = ((I_y - I_x) / I_x) \times 100$$

where I_y is the index from the current year and I_x is the index value at the start of the selected time period.

The final result is therefore percentage change in population size across a specified time period. Larger values indicate larger proportional changes in population size; positive values indicating relative increases, while negative values indicate relative decreases over the specified time period.

One final trend assessment was undertaken: 'historical change' (1987 – 2016) for the Republic of Ireland. Population estimates of wintering waterbirds are available from the period 1984/85-1986/87 (Sheppard, 1993), however they were reported at an all-Ireland level. To enable a direct comparison of national population estimates between the current timeframe and the mid-1980s, population estimates were therefore generated for each species for the 1980s period based on the respective proportions occurring during the 2006/07 – 2010/11 period (published in Crowe & Holt, 2013), i.e. these proportions were applied to All-Ireland population estimates generated for the mid 1980s to derive national estimates. A calculation of percentage change (as described above) was then used to compare the derived mid 1980s population estimate and the current national population estimate (in Burke *et al*., 2018b).

Many of the goose and swan species (e.g. Barnacle Goose and Greenland White-fronted Goose) were excluded from the trend analyses described above. Their populations are monitored by their species-specific surveys and in many cases it is assumed that the entire (or close to entire) population is counted. Trends for these species were therefore calculated by a direct comparison of census figures over time. Several other species were also excluded from trend analyses. These include elusive species such as Water Rail *Rallus aquaticus*, Moorhen *Gallinula chloropus*, Jack Snipe *Lymnocryptes minimus*, and Snipe *Gallinago gallinago* which have a secretive and retiring nature, and marine species such as Long-

tailed Duck *Clangula hyemalis* and Black-throated Diver *Gavia arctica*, which are difficult to survey from land. Introduced species, including Canada Goose *Branta canadensis* and Greylag Goose *Anser anser* (the naturalised population) have been excluded as there is no conservation requirement to define 1% thresholds for site assessment. Gulls and terns are not considered as they are not routinely counted during core counts, and their distributions are generally too widespread for adequate monitoring by these methods alone.

2.5.3 Site importance

For the assessment of site importance, for each site the peak count of each species in each season was compiled, irrespective of month. The mean peak count over the most recent five-season period available (2011/12 – 2015/16) was then calculated; this mean was used to dampen annual fluctuations in numbers. The peak number over the same period was also identified, along with the month(s) in which the peak count was most frequently recorded over this period; estimated only for those sites and seasons where more than three counts had been undertaken.

For each species, wetland sites were then ranked based on the five-year mean peak. Following standard criteria adopted by the Ramsar Convention (Ramsar Convention Bureau, 2000), a site was deemed to support numbers of international importance if it regularly supported 1% or more of the flyway population 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. The international, or flyway, thresholds were based on AEWA Conservation Status Review 7 (CSR7) (AEWA, 2018 – available on wpe.wetlands.org), while the all-Ireland thresholds are based on Burke *et al*. (2018b).

2.5.4 Pressures and threats

We are living in a rapidly changing world. The second half of the 20th century saw unprecedented growth in development, urbanisation and human population size. Unsurprisingly these over-arching changes, along with many and varied inter-related factors, have put the natural environment, including migratory waterbirds, under increasing pressure (IPBES, 2019). Predictions suggest that during the next 100 years, even greater changes will occur and this will put increasing pressure on wetlands and their biodiversity (O'Connell, 2000).

In relation to wintering waterbirds, pressures and threats can be defined as the principal factors responsible for causing individual species to decline, suppress their numbers, or restrict their ranges (DG Environment, 2017). Regular assessments of the pressures and threats facing wintering waterbirds are therefore fundamental to understanding not only why the numbers and distribution of our wintering waterbirds may be changing, but also to identify and inform conservation management measures at various spatial scales (site, region, national, flyway). This report therefore provides the results of a thorough assessment of the current pressures and threats facing Ireland's wintering waterbirds. The assessment relates to the time period as per reporting under Article 12 of the Bird's Directive, in that pressures relate to the six-year period 2013-2018, while future threats relate to the future two reporting periods (i.e. within 12 years following the end of the current period).

The assessment was undertaken for all regularly occurring Annex I waterbird species and other migratory waterbird species that trigger SPA designation nationally (DG Environment, 2017). The term 'pressure' is used to describe issues negatively affecting waterbird populations now and in the recent past, while the term 'threat' describes those issues likely to affect waterbirds populations negatively in the coming years. Pressures and threats were ranked as High (H), Medium (M) or Low (L) based on the following:

- High importance/impact: Important direct or immediate influence and/or acting over large areas (a pressure is the major cause or one of the major causes, if acting in combination with

other pressures, of significant decline of species population, distribution area or deterioration of habitat quality; or pressure acting over large areas preventing the species population of depleted species to expand);

- Medium importance/impact: Medium direct or immediate influence, mainly indirect influence and/or acting over moderate part of the area/acting only regionally (other pressure not directly or immediately causing significant declines);

- Low importance/impact: identified as a pressure or threat but not deemed to be of High or Medium importance.

3 Coverage

A total of 694 sites were covered between 2009/10 and 2015/16 (Figure 1), and of these sites, 81 are designated as Special Protection Areas. Of these total sites, 345 sites were covered in three or more seasons. All sites, together with grid references are listed in Appendix 2. A total of 631 sites and 1,775 subsites were covered during the most recent five-season period (2011/12-2015/16) ('current period'), upon which the assessment of site importance in the species accounts is based. Lakes comprise the largest proportion of sites covered (Table 1), followed by river/canals and estuaries.

The largest numbers of sites were covered in Counties Donegal, Galway, Mayo and Cork (Figure 2a), illustrating the abundance of wetlands available in each of these counties. When the area of each county is taken into consideration (Figure 2b), the relatively high coverage in smaller counties reflects an abundance of coastal wetland complexes in Counties Sligo, Waterford and Dublin, and the extensive drumlin lake complexes that are covered in Counties Leitrim, Cavan and Monaghan.

Table 1 Habitat types of sites covered between 2009/10 and 2015/16

Site habitat type	Number of sites (% of total sites in parentheses)
Lake	357 (51)
River/ canal	95 (14)
Estuary	69 (10)
Unknown habitat	56 (8)
Turlough	43 (6)
Non-estuarine coast	34 (5)
Grassland	14 (2)
Bog/Marsh	10 (1)
Reservoir	9 (1)
Quarry/ gravel pit	6 (1)
Lagoon	1 (0.1)

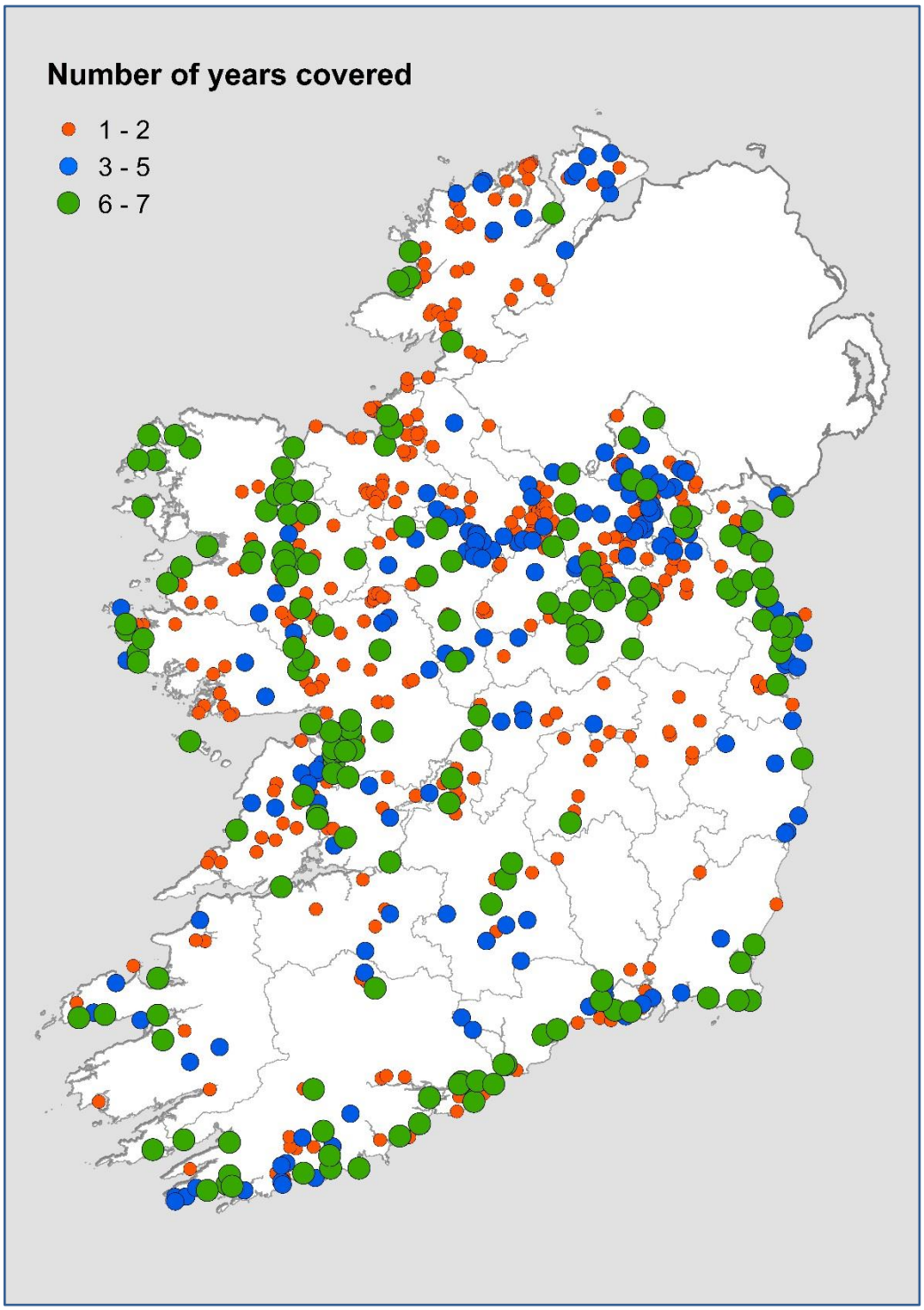


Figure 1 Site coverage between 2009/10 and 2015/16, illustrating the number of years that each site was covered irrespective of how many times the site was counted in a year.

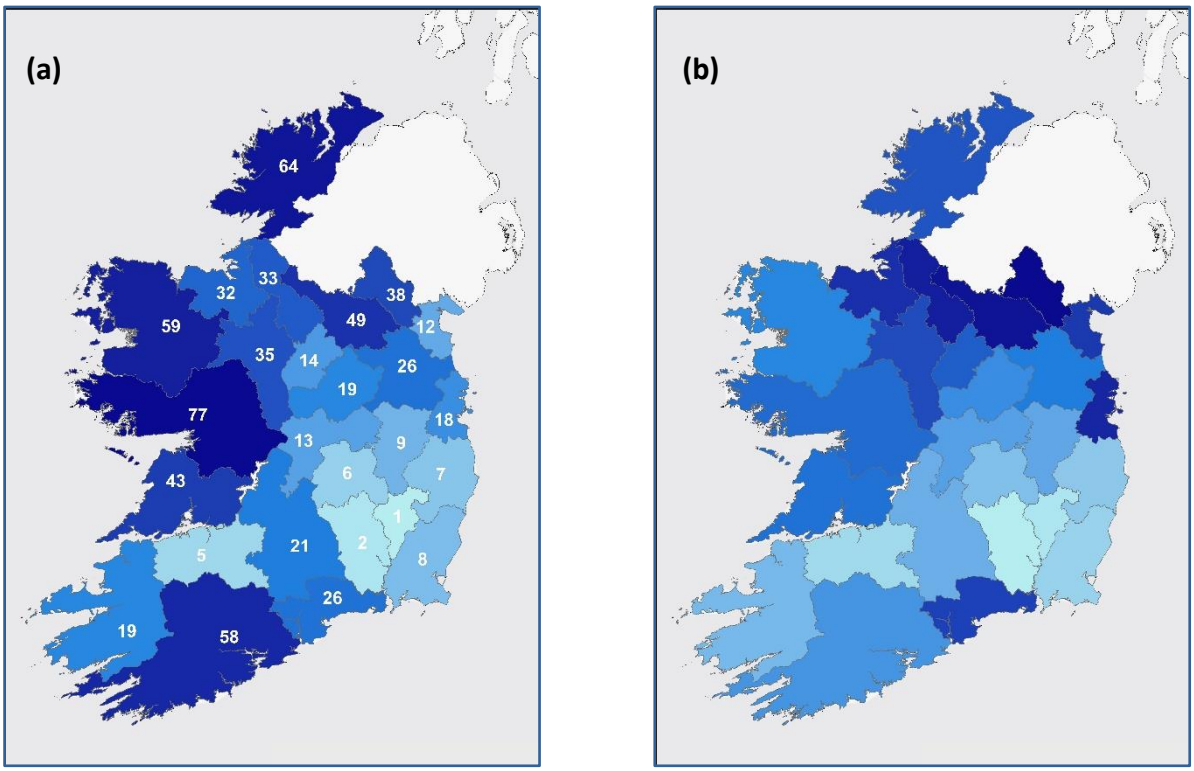


Figure 2 Site coverage by county, illustrating (a) the total number of sites covered in each county; and (b) the total number of sites covered per county area. Darker shades represent higher coverage in each case

I-WeBS coverage during the period of this report is broadly consistent with previous years, although there are some exceptions, which affect interpretation of data presented:

- Shannon & Fergus Estuary: Due to its size, count coverage of this site, the largest wetland complex in Ireland, is difficult, and is further complicated by access difficulties in many parts. I-WeBS ground-based subsite coverage has varied greatly over the years and subsite cover has dropped considerably since 2010/11 largely due to a lack of willing count volunteers. Aerial survey data are considered to be estimates only, and low-density species can be undercounted or missed. Based on the analyses undertaken it is likely that site totals generated using I-WeBS data largely underestimate the actual number of waterbirds using the Shannon and Fergus site complex.

- Lough Ree: While counts of this third largest lake in the Republic of Ireland (Crowe, 2005) have been consistent over time, some data from the current period have not yet been submitted to I-WeBS.

- Trawbreaga Bay: this site, which is a Special Protection Area, has received poor count coverage during the current period.

4 Species Accounts

4.1 Layout of species accounts

Species Common English Name / Scientific Name / Irish Name

Population origins: the breeding range of the population that winters in Ireland is shown. For example, Whooper Swan wintering in Ireland come from a population that breeds in Iceland, thus, in the species profiles this is listed as 'Iceland (br)'. Population origins are based on the African-Eurasian Waterbird Agreement (AEWA) Conservation Status Review 7 (CSR7) (AEWA, 2018) and published by Wetlands International (2018) (wpe.wetlands.org). Note that the subspecies is listed only for polytypic species. Where more than one population/race occurs in Ireland during winter the international threshold is shown for both, and the threshold which is used to assess sites of international importance is shown in bold font.

International threshold: from Wetlands International (2018).

All-Ireland threshold: from Burke *et al*. (2018b)

Population size (2011 – 2016):

All-Ireland: from Burke *et al*. (2018b).

ROI: from Burke *et al*. (2018b).

Associated with ROI SPA network: calculated as the proportion of the estimated population that occurred within Special Protection Areas (SPAs).

Population Change (%):

5 year: Percentage change between 2011/12 and 2015/16.

12 year: Percentage change between 2004/05 and 2015/16.

22 year: Percentage change between 1994/95 and 2015/16.

Historical: Percentage change between the mid 1980s and 2015/16 (please refer to methods).

Average annual change: calculated as the slope of the line of best fit through plotted annual indices for the 22-year data period

Please note that this waterbird population data template refers to the majority of regularly-occurring waterbird species included in the report with the exception of:

- (i) selected waterbird species for which data and trends originate from species-specific surveys (refer also to Section 2.5);
- (ii) a few species for which only highly conservative population estimates are produced (e.g. Common Scoter) and thus for which no meaningful population trends can be calculated; and
- (iii) waterbird species which were identified to be 'regularly-occurring' during the time period under consideration, but are either naturalised/feral, scarce, localised or otherwise occurring in numbers that are too low for accurate population estimates and trends to be calculated.

For these species, the population data presented are simply the national population estimate from Burke *et al*. (2018b) or the mean and peak number for the current period 2011/12 – 2015/16.

Summary data for all non-regularly-occurring waterbird species recorded during the I-WeBS period 2011/12-2015/16 are shown in Appendix 3.

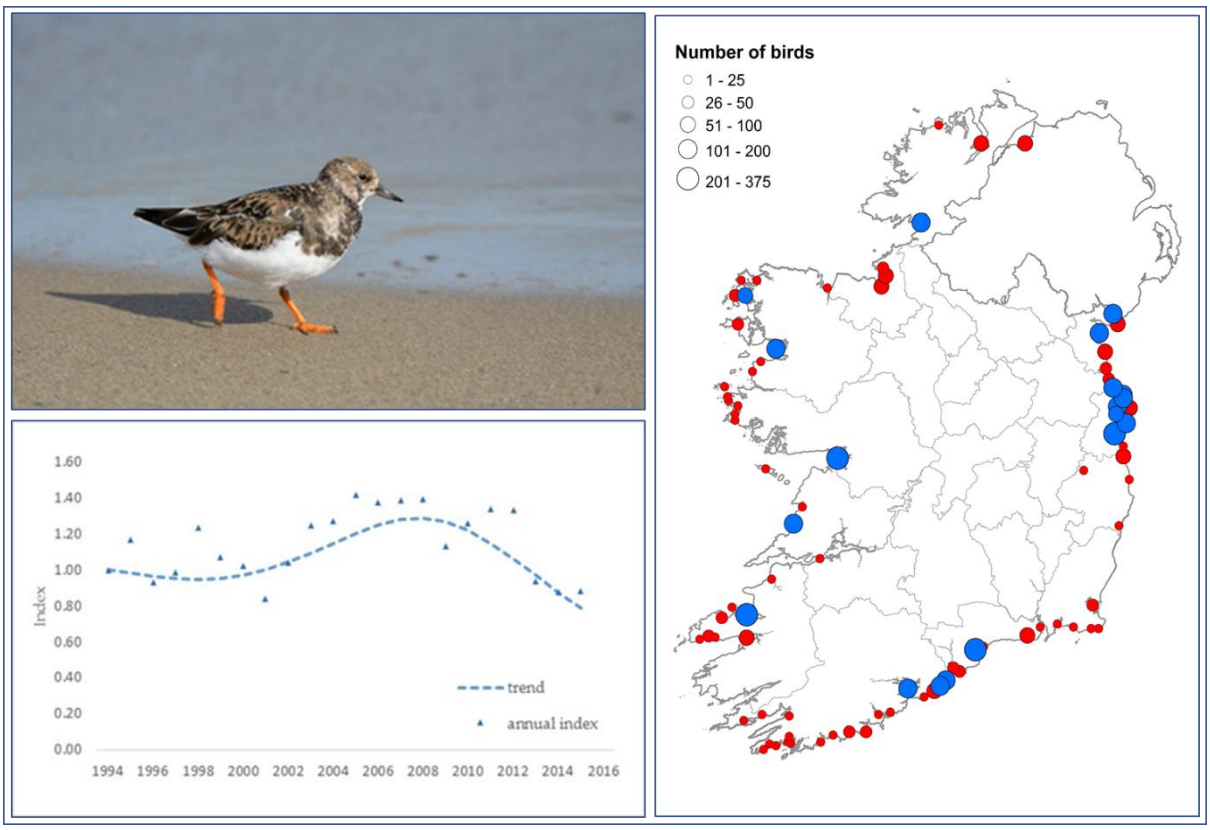


Figure 3 Sample Figure for Turnstone. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where the species was recorded during the period between 2011/12 and 2015/16 (red circles). The species trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Brian Burke).

Table 2 Sample Table for a hypothetical waterbird species, showing sites supporting internationally and nationally important numbers ranked on the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period. The month(s) are given in which the peak count was most frequently recorded over the current period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of international importance										
Dundalk Bay	5,167	2,631	3,381	3,157	4,647	3,749	3,606	3,708	4,647	Oct, Mar
Cork Harbour	1,339*	2,415*	2,955	2,770	2,681	3,299	3,048	2,951	3,299	Sep
Sites supporting numbers of national importance										
Clonakilty Bay [3]	1,329	878	1,192	749	871	1,551	1,080	1,089	1,551	Oct
Ballymacoda [3]	572*	398*	1,404	629		1,068	135*	1,034	1,404	Nov
Dungarvan Harbour [3]	1,458	1,648	677	842	520	1,386	1,136	912	1,386	Jan
Cashen River & Estuary [1]						28	1,200	307	1,200	Feb, Mar
Shannon Callows [4]		220		220				220	220	
Sites no longer of significance										
Lough Foyle †	113	213	122	66	318	97	50	131	318	Jan

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Shannon & Fergus Estuary [4]		1,112		121				121	121	Feb
Waterford Harbour	65		115					58	115	Jan

The grid references for all sites mentioned are given in Appendix 2.

Sites that supported numbers of national importance during the former period but no data were available for the current period are listed as a footnote.

Symbols presented in the table above indicate:

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS) for the two cross-border sites (Lough Foyle and Carlingford Lough).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[2]Site promoted (from supporting numbers of national importance to numbers of international importance) since the 2001/02 to 2008/09 period.

[3]Site demoted (from supporting numbers of international importance to numbers of national importance) since the 2001/02 to 2008/09 period.

[4]Aerial census data.

[5]Data from species-specific survey.

[6] Species not regularly recorded at the site during the former period (2001/02 and 2008/09).

4.2 Notes on interpretation

Please note that all waterbird data refer to the Republic of Ireland (I-WeBS data) unless stated otherwise.

Note that some sites are counted by both ground-based and aerial surveys. When both ground and aerial sites are included in a site assessment table then they are treated as two different sites, but please bear in mind that the distribution maps may show overlapping dots.

The cross-border sites Lough Foyle and Carlingford Lough are counted as both Northern Ireland (NI) and Republic of Ireland (ROI) sites and each is therefore treated as two different sites for site assessment.

Note that where the text refers to the 'current period' this relates to the period 2011/12 – 2015/16.

4.3 Mute Swan *Cygnus olor* Eala bhalbh

Ireland (br)

International threshold:	90	**Population change (%):**	
All-Ireland threshold:	90	5 year:	-4.8
Population size (2011-2016):		12 year:	-7.1
All-Ireland:	9,130	22 year:	+11.5
ROI:	7,032	Historical:	-9.6
Associated with SPA network:	4,365	Average annual change:	+0.5

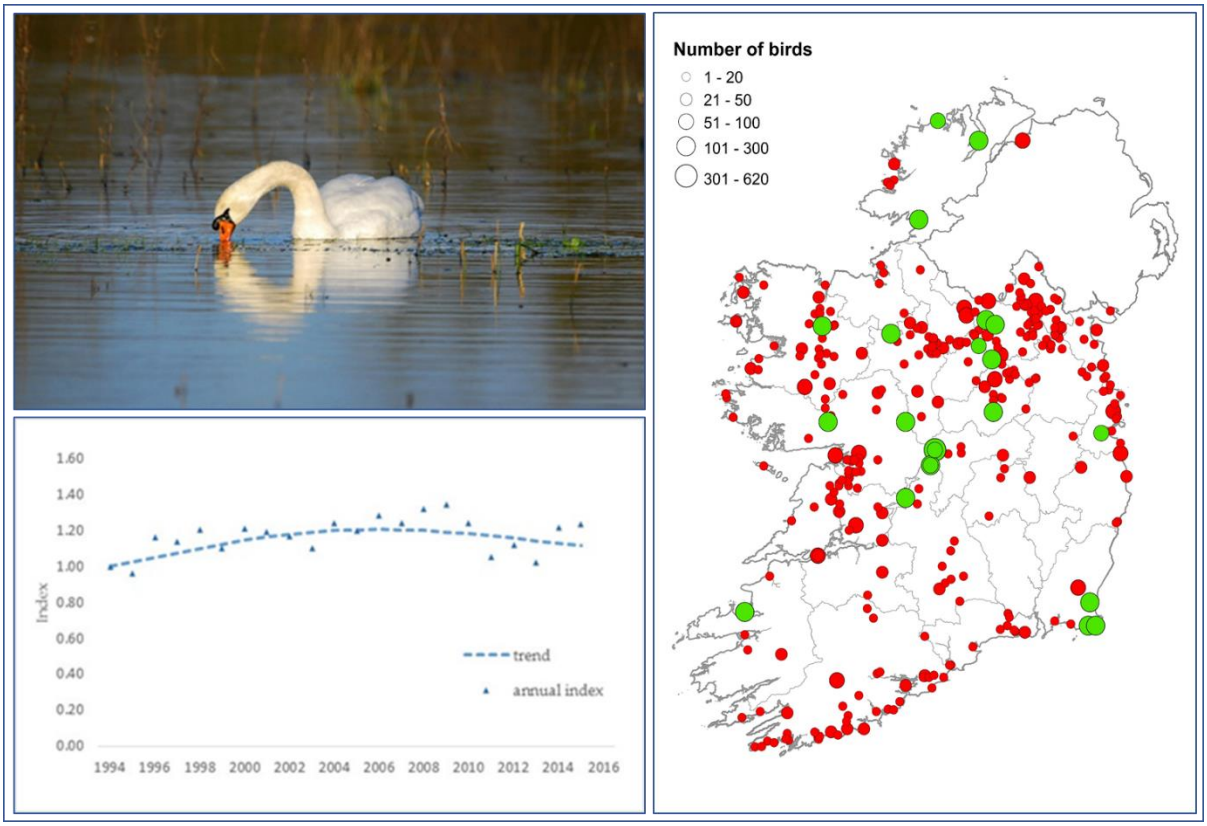


Figure 4 Distribution map and graphed population trend for Mute Swan. The distribution map illustrates sites supporting numbers of international importance (green circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Brian Burke).

Mute Swan are common across the temperate Palearctic, from western Europe across to north-east China. In some parts of its range the species is migratory, but those in Ireland are sedentary, with very little recorded movement of birds across the Irish Sea. For this reason, Ireland is considered to have its own distinct population (Wetlands International, 2012). The national threshold for site importance is therefore the same as the international threshold.

Numbers appear to have declined recently, by 5% and 7% in the last 5 and 12 years respectively. A similar trend has been observed in the UK population, with a decline of 8% in the ten years to winter 2015/16 (Frost *et al*., 2018). Numbers in Northern Ireland were stable in the last five years (Burke *et al*., 2018b). It should be noted that Mute Swan are very widely dispersed across wetlands of all sizes and locations, so population estimates for the species in Ireland are likely to be underestimates of their true numbers. Numbers at their most important sites tended to peak early in the winter (October, November). From December onwards, rain levels are likely to make other smaller sites increasingly suitable, allowing birds to disperse from core count areas.

Mute Swan were recorded at 321 sites during the current period and 23 sites supported numbers of international importance; predominantly large inland lakes and river callows but also coastal bays such as Donegal and Tralee. Galway Bay and Bray Harbour did not support numbers of significance however, despite having reported numbers of international importance in previous assessments.

Improved survey coverage of the Grand Canal has found numbers of international importance in recent years at this urban site. The greater-Dublin population is now the focus of demographic study again (Prole, 2018) having previously been examined in the late 1980s (Collins, 1991).

Table 3 Table showing sites supporting internationally/nationally important numbers of Mute Swan ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of international/national importance										
Shannon Callows [4]	339	775	500	739				620	739	
Lough Swilly	291	329	243	298	243	356	350	298	356	Nov
Lough Derg (Shannon) [4]	138	166	177	419				298	419	
Lough Kinale & Derragh Lough [1]	19*				174	295	231	233	295	
Tacumshin Lake	202	329	292	236	138	170	257	219	292	Nov, Dec
Lough Corrib	620	356	161*	246	270	305	8	207	305	Nov
Donegal Bay	186	192	156	226	210	224	197	203	226	Oct
Tralee Bay, Lough Gill & Akeragh Lough	204	178	166	162	174	230	256	198	256	Sep, Jan
Lough Oughter Complex	54*	49*	123	251	181	60*		185	251	
Lough Ennell	185	181	161	122	171	219	147	164	219	Oct
Lady's Island Lake [1]	65	129	206	68	102	39	333	150	333	Oct
Wexford Harbour & Slobs	86*	145*	128	147	138	147	176	147	176	Nov
River Suck [4]	172	176	94	184				139	184	
Little Brosna Callows			116	147	147	112	113*	131	147	Nov, Dec
Swellan Lough [1]					109			109	109	
Lough Cullin [1]	35	29	61	65	152	138	104	104	152	Oct
Lough Derg (Shannon)		209	101		171	79	62	103	171	
Lough Gara [1]	46	77	97*	83	109	92	127	103	127	Mar
Lough Gowna [1]		8		49	133	88	130	100	133	
Little Brosna Callows [4]	118	75	129	70				100	129	

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Dunfanaghy New Lake [1]	131*	142			92	104	101	99	104	Sep, Nov, Dec
Shannon Callows	13	88	155	58		114	53	95	155	
Grand Canal (Dublin) [1]			17*				92	92	92	
Sites no longer supporting numbers of international importance										
Inner Galway Bay	123	161	84	98	70	39	25	63	98	
Eslin River	4*	25*			46*			0	0	
Lough Ree		70				2*	58*	0	0	
Lough Derravaragh	77	138	79	82	92	72	77	80	92	
Bray Harbour	100	98	83	54				69	83	

* Low-quality count not included in the calculation of the mean.

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[4]Aerial census data.

4.4 Bewick's Swan *Cygnus columbianus bewickii* Eala bewick

bewickii, Arctic N. Russia (br)

International threshold:	220	**Population change (%):**	
All-Ireland threshold:	20	5 year:	-73.8[b]
Population size (2011-2016):		10 year:	-90.6[c]
All-Ireland:	21[a]	25 year:	-98.6[d]
ROI:	21[a]	Historical:	-98.9[e]
Associated with SPA network:	21[a]		

[a] from Crowe *et al*. (2015).

Population change based on the comparison of the 2015 population estimate (Crowe *et al*., 2015) with: [b] 2010 International Swan Census (Boland *et al*., 2010); [c] 2005 International Swan Census (Crowe *et al*., 2015); [d] 1990 International Swan Census (Beekman, 1997), [e] census of 1975/76 (Merne, 1977).

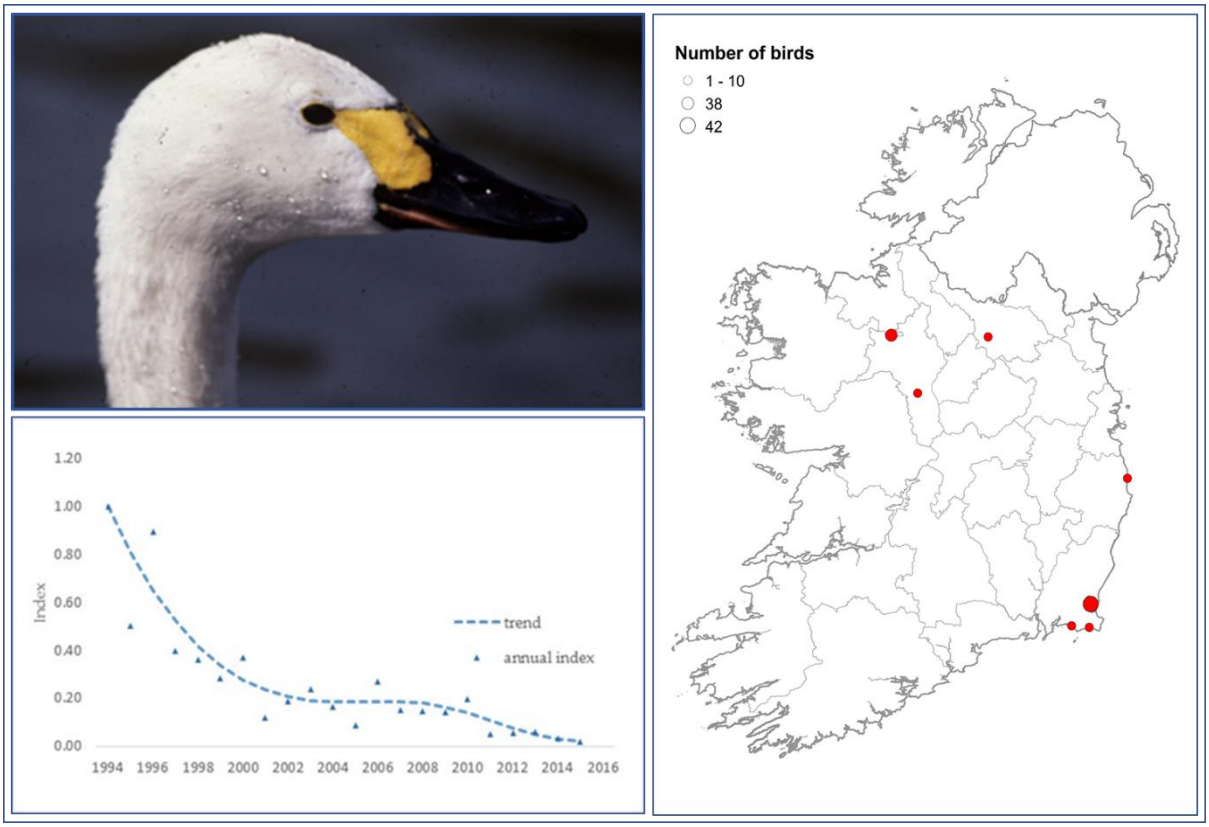


Figure 5 Distribution map and graphed population trend for Bewick's Swan. The distribution map illustrates the peak numbers recorded at I-WeBS sites between 2011/12 and 2015/16 (red circles). The population trend graph illustrates the population size obtained from census data 1990 – 2015. (Photo: Eddie Dunn).

There are three populations of Bewick's Swan (Wetlands International, 2018). Those that breed on the open maritime tundras of European Arctic Russia winter in north-west Europe (Rees & Beekman,

2010). Their wintering range includes the Netherlands, Britain, Germany, Denmark, Belgium, France and Ireland. Historically, Bewick's Swans outnumbered Whooper Swan in Ireland (Ussher & Warren, 1900) but a rapid decline became evident in the 1970s and 1980s that has continued to the present day (Crowe *et al*., 2015). A comparison of recent (2015) census data with those from 25 and 40 years ago, the latter being the first national cenus undertaken for this species in the winter of 1975/76 (Merne, 1977), reveals a wintering population decline of 99%. This decline has been attributed largely to the species migratory 'short-stopping' and retracting from the most westerly part of its range as a result of milder winters closer to the breeding grounds (Rees & Beekman, 2010). As numbers in Ireland fell initially, the flyway population as a whole was still increasing. Since the late 1990s however, the flyway population has undergone significant declines from over 29,000 birds in 1995 to 18,000 in 2010 (Rees & Beekman, 2010). No Bewick's Swan have been recorded in Northern Ireland in recent years, and the UK trend for the species is a 77% decline in the 25 years to 2015/16 (Frost *et al*., 2018).

Between 2001/02 and 2008/09, Bewick's Swan were recorded at just 25 sites in the Republic of Ireland, with a population estimate of just over 200 swans for that period (Boland & Crowe, 2012; Crowe *et al*., 2005; Worden *et al*., 2006). In the last five years, from 2011/12 to 2015/16, Bewick's Swan were recorded at just seven sites. The remaining birds tend to favour Wexford Harbour and Slobs during the winter, with occasional movement to other sites in Wexford. It seems unlikely that Bewick's Swan numbers or distribution in Ireland are likely to improve again in the future and so these Wexford birds may be the last to winter here regularly.

Table 4 Table showing sites that formerly held numbers of national importance of Bewick's Swan and their mean and peak counts for the period 2011/12 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites no longer of significance										
Wexford Harbour & Slobs	65*	75*	42	14	14	14	11	19	42	Jan
The Cull & Killag (Ballyteige)		15		10		2		2	10	Jan
Tacumshin Lake			2	2		4	2	2	4	
North Wicklow Coastal Marshes			8					2	8	
Other sites										
Lough Gara			38*							
River Erne: Oughter - Gowna							9*			
Southern Roscommon Lakes			1							

* Low-quality count not included in the calculation of the mean.

4.5 Whooper Swan *Cygnus cygnus* Eala Ghlórach

Iceland (br)

International threshold:	340	**Population Change**	
All-Ireland threshold:	150	5 year:	+13.4[b]
Population size (2011-2016):		10 year:	+21.6[c]
All-Ireland:	15,370[a]	24 year:	+39.6[d]
ROI:	11,852[a]	Historical:	+49.2[e]
Associated with SPA network:	4,052[a]		

[a] from Crowe *et al*. (2015).

Population change based on the comparison of the 2015 population estimate (Crowe *et al*., 2015) with: [b] 2010 International Swan Census, Boland *et al*., 2010); [c] 2005 International Swan Census (Crowe *et al*., 2015); [d] 1991 International Census of Whooper Swans (Kirby *et al*., 1992), [e] 1986 Whooper Swan census of Britain, Ireland and Iceland (Salmon & Black, 1986).

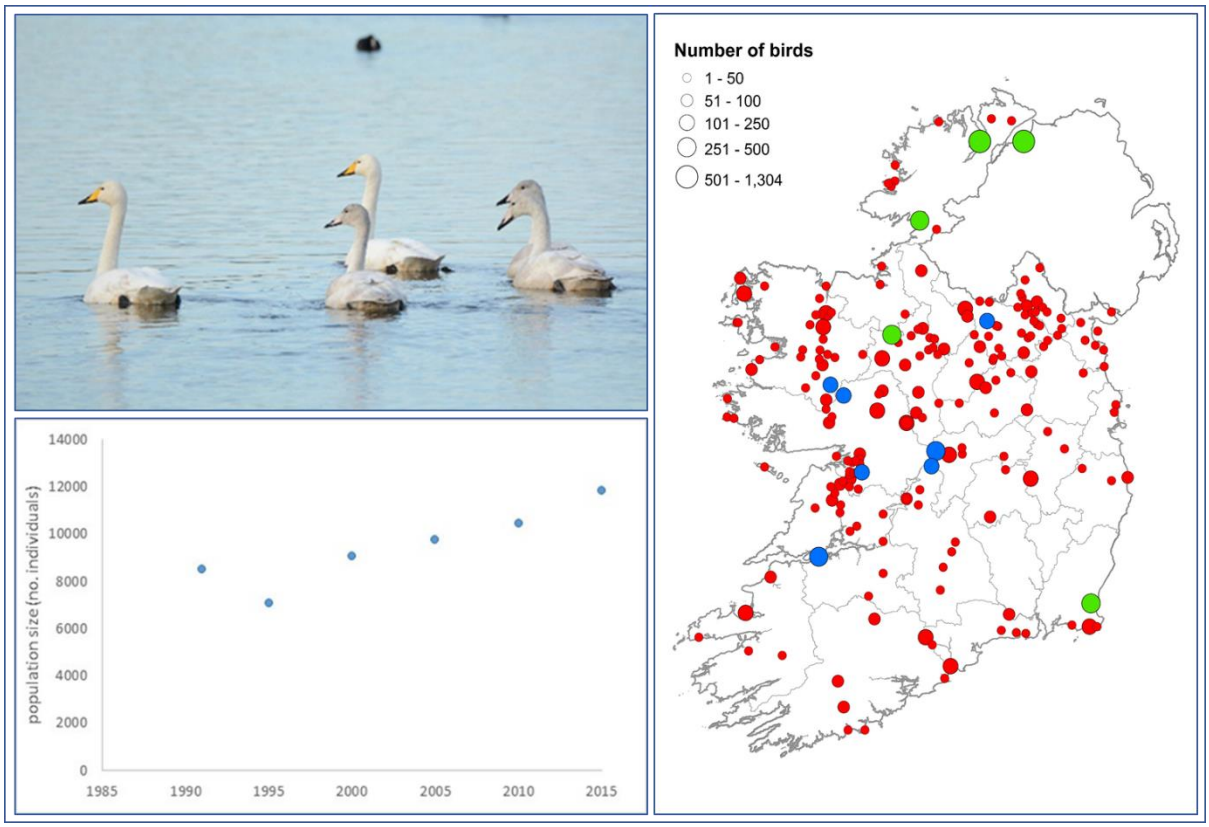


Figure 6 Distribution map and graphed population trend for Whooper Swan. The distribution map illustrates sites supporting numbers of international importance (green circles), national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend graph illustrates the population size obtained from census data 1991 – 2015 (Photo: Brian Burke).

There are five populations of Whooper Swan (Wetlands International, 2018). Those that occur in Ireland come from the Icelandic-breeding population, which also winters in Britain, with increasing

numbers remaining to winter in Iceland (Brazil, 2003; Hall *et al*., 2016). A coordinated census has been carried out on a five-yearly basis since January 1986, when 16,700 swans were recorded across the populations wintering range. The most recent census in January 2015 found that the flyway population had increased by 16% since 2010, to 34,004 individuals – the highest census total to date (Hall *et al*., 2016).

The Republic of Ireland supported 11,852 Whooper Swan during the 2015 census, 34.9% of the flyway population (Hall *et al*., 2016). Numbers in the Republic of Ireland in 2015 had increased by 12.7% since 2010, although the proportion of the overall population had decreased (from 35.9%; Hall *et al*., 2012) following notable increases in both England and Scotland. Despite this, the proportion of young amongst flocks was highest in Ireland (Hall *et al*., 2016). Whooper Swan numbers in Northern Ireland fell by 24% from 2010 to 2015, and currently represent over 10% of the flyway population. Overall results of the 2015 census provide evidence of an overall shift to the south-east in the species' winter distribution (Hall *et al*., 2016). Numbers of juveniles in flocks was relatively high in both the Republic and Northern Ireland during the 2015 census at 22.5% and 21.8% respectively, compared to the overall proportion of 19.9% across Iceland, Ireland and Britain collectively (Hall *et al*., 2016), and the Irish Whooper Swan Study Group continues to monitor this on an annual basis (G. McElwaine pers. comm.).

Results of the 2015 census attest to the widespread distribution of Whooper Swan in Ireland – recorded in 473 subsites and 253 sites across all but two counties in Ireland. Almost 70% of swans were recorded on pasture, with 18% on permanent waterbodies, highlighting the need for targeted survey efforts at regular intervals to provide accurate estimates of population size and changes in distribution (Hall *et al*., 2016). Their distribution within the Republic of Ireland skews to the north and west, with counties Galway, Roscommon, Mayo and Cavan all supporting over 1,000 swans during the most recent census (Crowe *et al*., 2015).

Based on I-WeBS data for the current period (2011/12 – 2015/16), five sites were identified as supporting numbers of international importance, while a further seven sites supported numbers of national importance (Table 5a). Ten sites that held significant numbers of Whooper Swan between 2001/02 and 2008/09 are no longer of significance based on counts in the last five years. Coverage at some of these sites has been limited in recent years, however, and given the mobile nature of Whooper flocks within and between winters (Crowe *et al*., 2015) it is possible that more regular count coverage within and across winters may reconfirm their significance for Whooper Swan. Based on swan census data, a further three sites held numbers of international importance during 2015 (Table 5b), while a further 13 sites held numbers of national importance.

Table 5a Table showing sites supporting internationally and/or nationally important numbers of Whooper Swan ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of international importance										
Lough Foyle †	2,033	506	1,509	2,365	1,390	556	702	1,304	2,365	Oct
Lough Swilly	2,877	948	2,810	917	640	1,125	618	1,222	2,810	Oct, Mar
Wexford Harbour & Slobs	302*	203*	437	387	195	576	535	426	576	Nov, Jan
Lough Gara [1]	392	141	252*	382	453	333	23*	389	453	Mar
Donegal Bay [2]	76	130	138	682	293	466	217	359	682	Oct

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Shannon Callows [3,4]	255	207	299	305				302	305	
Shannon & Fergus Estuary [3 4]	257	200	352	194				273	352	
Lough Oughter Complex	89*	89*	202	291*	224	108*		213	291	
L. Coy - Blackrock - Bullaunagh – Ballylee [1]	174	248	363	146	234		66	202	363	Nov
Little Brosna Callows [1]			219	125	222	201	42*	192	222	Nov
Kilglassan Turlough/ Greaghans	76	107	197	223	176		123	180	223	Jan
North Central Galway Lakes	164*	163	233	84	154		193	166	233	Jan
Sites no longer supporting numbers of national importance										
Blackwater Callows	225		194	99	132	154		145	194	Mar
North East Galway Lakes	74	229	201	199	16		81	124	201	Mar
East Ballinamore Lakes	58	77*	114		79	153		115	153	
River Suck [4]	331	170	48	176				112	176	
River Moy	97*	195	161		61			111	161	
Lough Iron	261	160	101	100	60	91	120	94	120	Mar
Corofin Wetlands	51	120		4	155	107	157	85	157	Jan
River Suck						64	51	58	64	
Coole Lough - Newtown Turlough	28*	27	102	70	8		91	54	102	Jan

Sites that supported numbers of national importance during the former period but insufficient data were available for the current period: Lough Ree.

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[2]Site promoted (from supporting numbers of national importance to numbers of international importance) since the 2001/02 to 2008/09 period.

[3]Site demoted (from supporting numbers of international importance to numbers of national importance) since the 2001/02 to 2008/09 period.

[4]Aerial census data.

Table 5b Sites that supported internationally and/or nationally important numbers of Whooper Swan during the 2015 swan census (Crowe *et al*., 2015; Hall *et al*., 2016).

Site	Peak number
Other sites supporting numbers of international importance	
River Suck	386
Kilmacshane	365
Cashen River & Estuary	341
Other sites supporting numbers of national importance	
Tacumshin Lake	316
Brees Wetlands	231
Garryduff	228
Glen Lough	215
East Ballinamore Lakes	210
Ballyhaunis Lakes	208
Castleplunket Turloughs	204
Blacksod & Tullaghan Bays	193
Lower Blackwater River	187
River Foyle	178
North East Galway Lakes	157
Finn-Lacky Catchment	156
Blackwater Callows	154

4.6 Pink-footed Goose *Anser brachyrhyncus* Gé ghobghearr

Greenland, Iceland (br)

Scarce winter visitor

International threshold: 5,400

Mean/Peak - ROI (2011/12-2015/16): 135/188

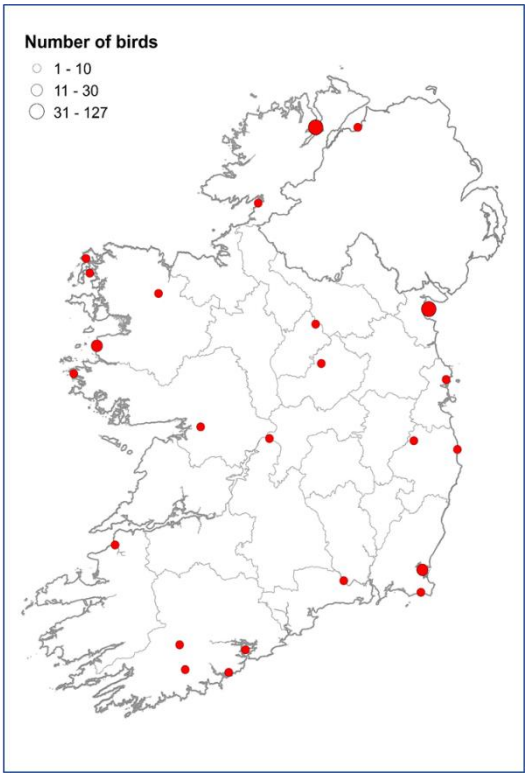


Figure 7 Distribution map for Pink-footed Goose showing peak numbers recorded at sites between 2011/12 and 2015/16 (Photo: Brian Burke).

The Pink-footed Goose population that breeds in Iceland and Greenland winters almost exclusively in Britain, with relatively small numbers visiting Ireland (Mitchell, 2002; Brides *et al.*, 2018). Numbers have increased in recent years (Brides *et al.*, 2018) and the highest flyway population estimate ever recorded was in 2015 (536,871; Mitchell, 2016). Their numbers in Ireland have also increased, by around 100 birds – a modest number in the context of the overall population. Between 2004/05 and 2008/09 they reached a peak of 86 geese (mean 30; Boland & Crowe, 2012), whereas from 2009/10 to 2015/16 the maximum number in any one year was 184 (mean 133).

Pink-footed geese were recorded at 33 sites between 2009/10 and 2015/16, and at 26 sites during the current period (compared to 28 sites in the previous period; Boland & Crowe, 2012). They were most regularly recorded at Lough Swilly, Wexford Harbour & Slobs and Dundalk Bay.

Table 6 Table showing sites that supported Pink-footed Goose in five or more seasons between 2009/10 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Dundalk Bay	3	35	30	32	71	111	127	74	127	Jan
Lough Swilly	14	7	46	1	34	3	42	25	46	Mar
Wexford Harbour & Slobs	9	27	12	22	9	13	5	12	22	Nov, Jan
North Wicklow Coastal Marshes	9	1	2	1			1	1	2	Oct, Dec, Jan

Other sites that supported Pink-footed Goose in less than five seasons (peak count 2011/12 – 2015/16):

Bandon River (1), Blacksod & Tullaghan Bays (2), Cashen River & Estuary (1), Cork Harbour (1), Donegal Bay (1), Drumcliff Bay Estuary (2), Inishcarra Resevoirs (1), Little Brosna Callows (2), Lough Conn (1), Lough Foyle (NI) (4), Lough Gowna (3), Lough Iron (6), Omey Strand (1), Poulaphouca Reservoir (1), Rahasane Turlough (2),River Suir Lower (3), Rogerstown Estuary (8), South Mayo Coast (26), Southern Roscommon Lakes (1), Stick Estuary (Oysterhaven) (1), Tacumshin Lake (1), Termoncarragh & Annagh Marsh (2).

4.7 Greenland White-fronted Goose *Anser albifrons flavirostris* Gé Bhánéadanach

Greenland (br)

International threshold:	190	**Population Change (%):**	
All-Ireland threshold:	100	5 year:	-14.5
Population size (2018):		10 year:	-5.0[c]
All-Ireland:	9,590[a]	25 year:	-20.9[d]
ROI:	9,500[a]	Historical:	-12.5[e]
Associated with SPA network:	9,346 - 9,428[a]		

[a] from Fox *et al*. (2018).

Population change based on the comparison of the 2018 population estimate (Fox *et al*., 2018) with: [b]2013 International Census (Fox *et al*., 2013); [c]2008 International Census (Fox *et al*., 2008); [d]1993 International Census (Fox *et al*., 1994); [e]spring 1985 International Census (Fox *et al*., 1994).

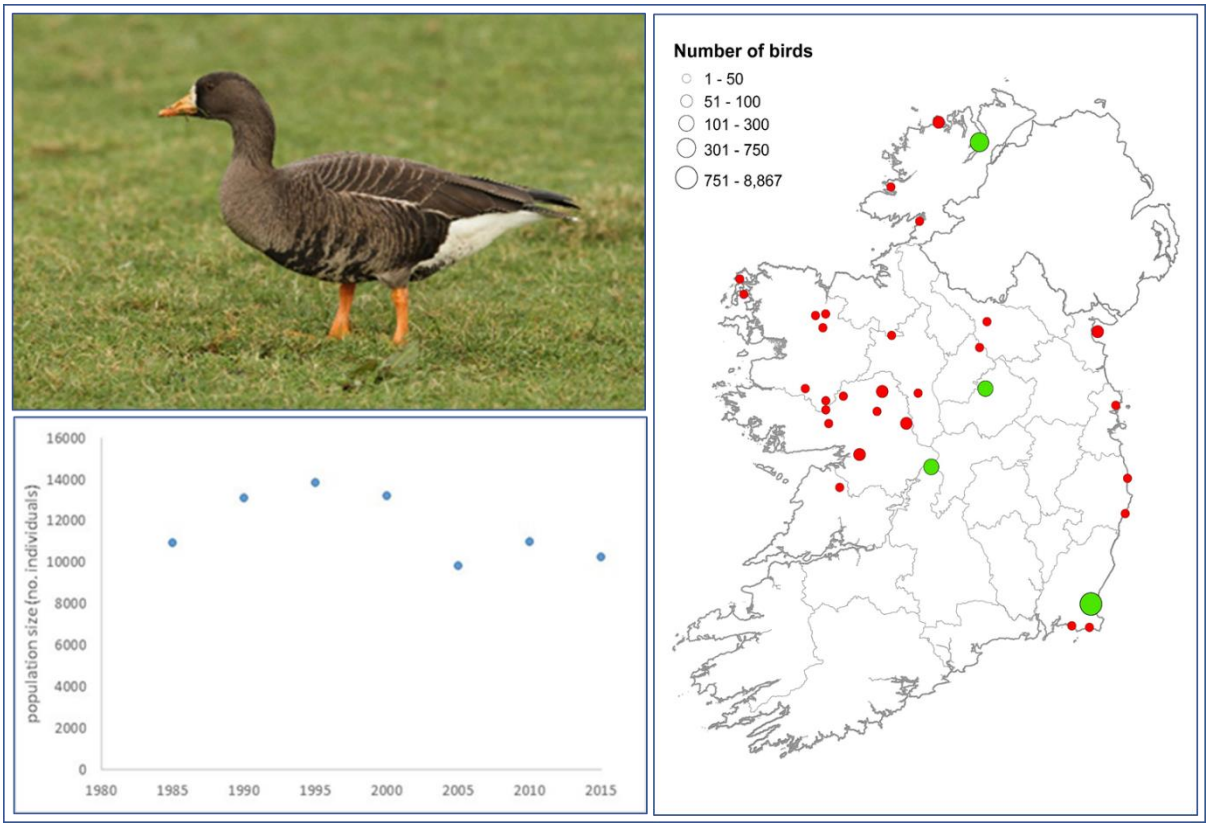


Figure 8 Distribution map and graphed population trend for Greenland White-fronted Goose. The distribution map illustrates sites supporting numbers of international importance (green circles), national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend graph illustrates the population size obtained from census data 1985-2018 (note only all-Ireland census data are available from 1995-2005, hence gap in ROI data presented here) (Photo: Dick Coombes).

The Greenland White-fronted Goose is a subspecies of the Greater White-fronted Goose that breeds in west Greenland and winters in Britain and Ireland. Regular annual monitoring of the species in Ireland began in winter 1982/83 when a moratorium on their shooting was introduced here. In spring 1983 the Irish population stood at 9,259 geese (9,098 ROI, 161 NI; Fox *et al*., 1994) in 34 flocks, representing 56% of the flyway population. Annual monitoring across the island charted the species increase to a peak of 13,575 birds in spring 1999 (Stroud *et al*., 2012). Despite this net increase in birds, a number of areas were deserted by White-fronts during this period and an overall shift towards the north and east of their wintering range was becoming evident. The flyway population was also increasing rapidly at this time, outpacing the increases seen in Ireland, and so this shift to the north-east of their wintering range meant the Irish proportion of the flyway population actually decreased to 38% (Stroud *et al*., 2012). Since those peak counts in spring 1999, numbers have undergone acute declines both nationally and internationally. In spring 2018 the flyway population numbered 20,529 individuals, similar to the 2017 total but up from 18,879 in spring 2016 (Fox *et al*., 2018). Numbers in Ireland in winter 2016/17 were lower than they were before the shooting moratorium began in 1982/83, though Ireland still supports around 45% of the flyway population. In the most recent spring census in 2018, numbers in Ireland had risen slightly to 9,587 (Fox *et al*., 2018). There are now 20-25 extant flocks in Ireland, nine of which have held less than 30 birds in each of the last two winters (2016/17, 2017/18; Fox *et al*., 2017; 2018). Numbers at their largest wintering site on the Wexford Slobs have been buffered from much of these declines by acting as a population sink (Weegman *et al*., 2016). The overall population decline in recent years has been attributed to chronic low breeding productivity, which has been particularly evident in the Irish flocks (Fox *et al*., 2018).

The Greenland White-fronted Goose was recorded at 33 sites during the current period, down from 67 sites during the former period (2001/02 to 2008/09) (Boland & Crowe, 2012). Wexford Harbour & Slobs, Lough Swilly and the Little Brosna Callows all continued to support numbers of international importance. Lough Iron has been promoted to this list, having supported numbers of national importance during the previous period. Both the River Suck (aerial count) and Glenamaddy Turlough supported numbers of national importance on one occasion during the current period, but the mean peak was below the threshold for significance. Both of these sites are recognised as being used by the same wintering flock (Fox *et al*., 2012). Similarly, numbers at Dunfanaghy New Lake in recent years no longer reach the threshold for significance.

As with other goose and swan species, it should be noted that Greenland White-fronted geese often feed away from wetland sites during the daytime and so may not be recorded during core I-WeBS counts. The true number relying on a wetland site to roost, for example, could therefore be significantly underestimated. For this reason, targeted census counts of the Greenland White-fronted Goose provide a better account of the true numbers in an area and the sites they rely on for both feeding and roosting. In Ireland these counts are coordinated by the National Parks and Wildlife Service (NPWS), and results are published the following autumn by NPWS and the Greenland White-fronted Goose Study Group (e.g. Fox *et al*., 2018). These reports are therefore of key importance when determining the importance of a site or area to this species.

Table 7 Table showing sites supporting internationally and/or nationally important numbers of Greenland White-fronted Goose ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of international importance										
Wexford Harbour & Slobs	7,984*	8,144*	9,769	8,700	9,343	8,060	7,565	8,687	9,769	Jan
Lough Swilly	550	883	793	633	926	592	724	734	926	Feb
Lough Iron [2]	253	293	487	263	205	290	212	291	487	Mar
Little Brosna Callows [4]	230	230	200	200				200	200	Jan
Sites supporting numbers of national importance										
Little Brosna Callows			211	105	115	145	104*	144	211	Jan
Sites no longer supporting numbers of national importance										
Dunfanaghy New Lake					50	110	82	81	110	Mar

Sites that supported numbers of national importance during the former period but no data were available for the current period: Cahore Marshes.

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[2]Site promoted (from supporting numbers of national importance to numbers of international importance) since the 2001/02 to 2008/09 period.

[3]Site demoted (from supporting numbers of international importance to numbers of national importance) since the 2001/02 to 2008/09 period.

[4]Aerial census data.

4.8 Greylag Goose *Anser anser* Gé ghlas

Iceland (br)

International threshold:	980	**Population Change (%):**	
All-Ireland threshold:	35	8 year:	-20.8[b]
Population size (2011-2016):		14 year:	-29.4[c]
All-Ireland:	3,550[a]	19 year:	-20.8.[d]
ROI:	1,954[a]	Historical:	+10.1[e]
Associated with SPA network:	1,742		

[a] from Burke *et al*. (2018b).

Population change based on the comparison of the 2018 All-Ireland population estimate (Burke *et al*., 2018b) with: [b] All-Ireland population estimate from 2010 (Crowe & Holt, 2013, as revised in Burke *et al*. 2018b), [c] All-Ireland population estimate from 2004 (Crowe *et al*. 2008), [d] All-Ireland population estimate from 1999 (Crowe *et al*. 2008), [e] All-Ireland census of 1986 (Merne, 1986).

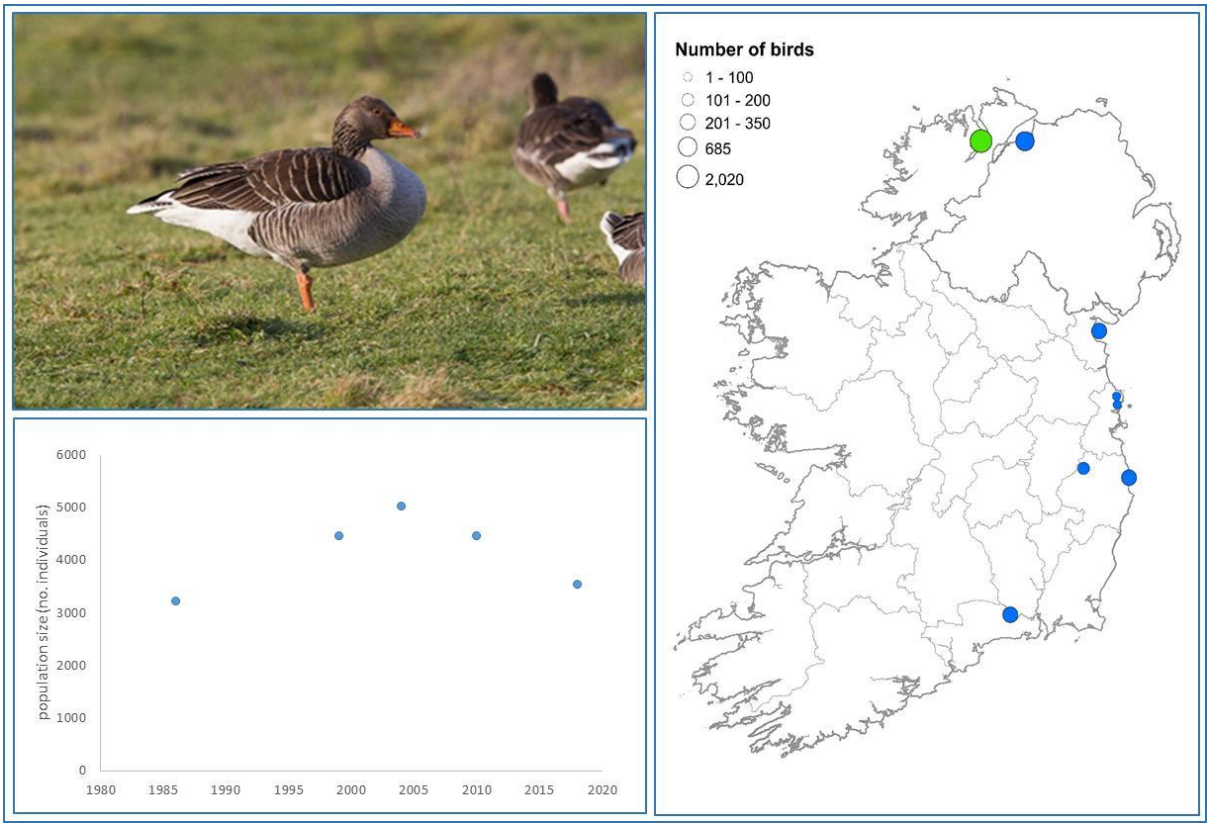


Figure 9 Distribution map and graphed population trend for Greylag Goose. The distribution map illustrates sites supporting numbers of international importance (green circles), national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). Note that the map shows both feral and Icelandic birds (i.e. the entire mixed-origin flock). The population trend graph illustrates the population size based on modelled population estimates 1986 – 2018 (Photo: Mark Carmody).

The Icelandic-breeding Greylag Goose population predominantly winters in northern Britain, with smaller numbers in Ireland, south-west Norway and the Faroe Islands, as well as some birds

remaining in Iceland (Mitchell, 2015; Brides *et al*., 2018). The I-WeBS counter network contributes to an annual autumn census of the species across their wintering range, coordinated by the Wildfowl and Wetlands Trust (Brides *et al*., 2018). Total autumn estimates have exceeded 80,000 geese for much of the last 40 years, with over 100,000 birds estimated during periods in the mid-1980s and mid-2000s, and occasional decreases below 80,000 in the late 1990s and early 2000s (Brides *et al*., 2018). The autumn 2017 estimate of 60,692 Icelandic Greylag geese across wintering grounds in Britain, Iceland, Ireland and Norway was therefore very low, though this is likely to have been somewhat of an underestimate due to the timing of counts possibly missing some migrating birds. Large numbers of resident Greylag geese in core wintering areas in Britain (e.g. Orkney, Moray Firth) further complicate attempts to estimate the abundance of Icelandic geese (Brides *et al*., 2018). This is also an issue in Ireland, particularly in the Lough Swilly and Foyle area which hosts the largest numbers of both Icelandic and resident Greylag geese in the country (Boland & Crowe, 2008).

Numbers of Icelandic Greylag geese in Ireland have fluctuated since coordinated waterbird monitoring began here (Sheppard, 1993; Crowe *et al*., 2008; Crowe & Holt, 2013). A northward contraction of their range was identified as far back as the 1930s (Berry, 1939) and continues to the present day (Mitchell *et al*., 2010). As their numbers and range were decreasing in Ireland, sites in Scotland recorded significant increases (Hutchinson, 1979). In more recent years, Greylag geese overwintered in southern Iceland for the first time in 2007/08 (Mitchell, 2009; Mitchell *et al*., 2010). Numbers in Ireland vary considerably throughout the winter too. At most sites, numbers build up and are sustained through the mid-winter period, as seen with most other wintering waterbird species (Boland & Crowe, 2008). Numbers at sites in Donegal, particularly Lough Swilly, tend to peak in November as birds arrive directly from Iceland and subsequently decrease as birds redistribute elsewhere by mid-winter (Boland & Crowe, 2008). Unpublished results from the ringing and neck-collaring study by NPWS, BirdWatch Ireland and Inch Wildfowlers Club provides some evidence for some birds moving from the Lough Swilly area to sites elsewhere in Ireland, Northern Ireland and Scotland within winters.

Only Lough Swilly supported numbers of international importance during the current period. In September 2017, a count of 870 Greylag Geese was recorded at Lough Swilly (L. McDaid pers. comm.). Given the timing of the count, this is likely to be the full naturalised/feral population of Greylags in the area, and this figure has been subtracted from the relevant national and local counts to determine the true numbers of Icelandic birds during the recent period.

Elsewhere, seven sites continue to support numbers of national importance. No data were available for the current period for two sites that supported numbers of national importance during the former period (Mountseskin/Gortlum and Braganstown).

Table 8 Table showing sites supporting internationally and/or nationally important numbers of Greylag Goose ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of international importance										
Lough Swilly §	1,999	2,006	1,330	2,761	2,034	1,856	2,121	2,020	2,761	Dec, Feb
Sites supporting numbers of national importance										
Lough Foyle (NI)[3] †∞			1,135	1,360	729	32	170	685	1,360	
Dundalk Bay	489	650	384	146	324	702	78	327	702	Nov, Mar
River Suir Lower	288	320	564	376	59	247		312	564	
North Wicklow	361	293	285	59*	325	200*	304	305	325	Dec

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Coastal Marshes										
Poulaphouca Reservoir	92		158	152	193	150		163	193	Jan
Rogerstown Estuary	134	19	33	89	5	33	95	51	95	Nov
Skerries, Baldongan		185	122	68	6			39	122	

Sites that supported numbers of national importance during the former period but no data were available for the current period: Mountseskin/Gortlum; Braganstown.

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[3]Site demoted (from supporting numbers of international importance to numbers of national importance) since the 2001/02 to 2008/09 period.

§ Lough Swilly totals include a feral flock which has recently been estimated at close to 870 birds in September 2017.

∞ Lough Foyle totals include an unknown proportion of feral birds.

4.9 Greylag Goose (feral) *Anser anser* Gé ghlas

Feral/ naturalised population

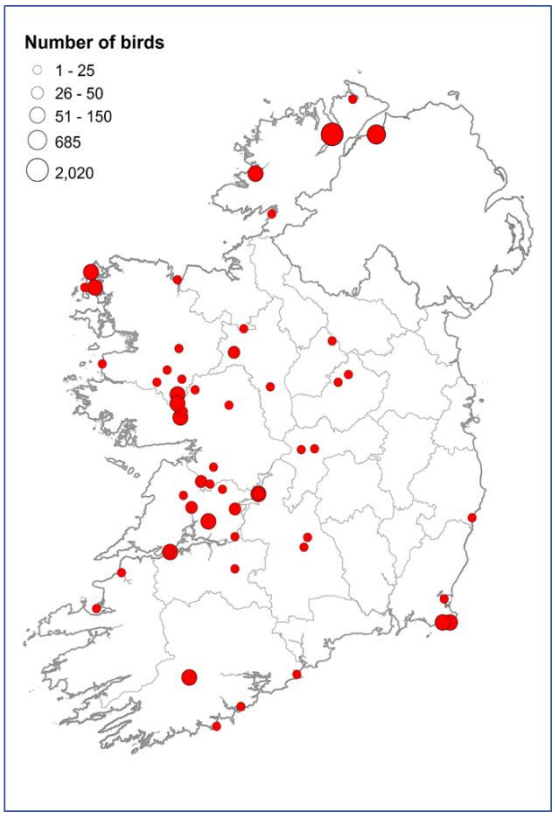


Figure 10 Distribution map for feral Greylag Goose. The distribution map illustrates all sites where recorded during the period between 2011/12 and 2015/16 (red circles). Note that the map shows both feral and Icelandic birds (i.e. the entire mixed-origin flock) (Photo: Mark Carmody).

Resident feral/naturalised Greylag geese were recorded at 52 sites between 2011/12 and 2015/16. This was a decrease on the 82 sites reported for the former period, but numbers have continued to increase. The population now stands at over 2,800, an increase of around 1,300 individuals since 2008 (Boland & Crowe, 2008). As with other goose species, their preference for grassland feeding means numbers are likely to be underestimated somewhat through core count methodology. The resident population is likely descended both from birds released by wildfowlers, as well as from the north-west Scotland population which is thought to be the remnants of the population that once occurred more widely across Britain (Mitchell *et al*., 2012). As in the UK, it is not possible or practical to separate resident Greylags of either provenance. Movement of birds from the naturalised population in Scotland to Irish sites in the winter has been observed, through a colour-ringing study carried out by NPWS, BirdWatch Ireland and Inch Wildfowlers Club.

Wintering Greylag geese in the Swilly/Foyle area of Donegal and Tyrone are known to be a mix of both resident and Icelandic-breeding birds. Counts in September 2017 found 870 Greylag geese in the area (L. McDaid pers. comm.), making this by far the largest flock in the country. Elsewhere, flocks at Termoncarragh & Annagh Marsh (Mayo), Lough Derg and the Shannon & Fergus Estuary (Galway, Limerick) and Lady's Island Lake (Wexford) all numbered over 100 individuals on average over the recent five-year period examined.

Table 9 Sites supporting an average 20 or more feral/naturalised Greylag geese between 2011/12 – 2015/16. Note that for Lough Swilly, an average is not given, rather the figure represents the best available estimate of feral birds at this site.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites regularly supporting 20 or more birds										
Lough Swilly **								870		
Termoncarragh & Annagh Marsh	141	97	194	96	110	142		136	194	Oct
Shannon & Fergus Estuary [5]	100	158	238	165	80	170	4	131	238	Jan
Lough Derg (Shannon) [4]	38	57	96	149				123	149	
Lady's Island Lake	117	126	147	33	144	132	65	104	147	Jan
Inishcarra Reservoirs	80	7	67	88	102	12*	130	97	130	Dec
South East Clare Lakes	20*	89	51	48	103	104	120	85	120	Oct, Jan
Ballybackagh [5]						110	53	82	110	
Blacksod & Tullaghan Bays	32	67*	108	110	110	79		81	110	
Tacumshin Lake	95		49	92	95	93	67	79	95	Oct, Dec
Lough Corrib [5]	28	25	110*	31	45	160	44	70	160	Jan
Rostaff Lake	122	17	70	100		55	30	51	100	Oct
Ballyallia Lake [5]	6	16			33	80	21	45	80	Nov
Scarriff area [5]							44	44	44	
Lough Derg (Shannon)		30	48	48	46	20	48	41	48	
Drumalough [5]					40			40	40	
Termon Turloughs [5]		18	1	89	58	49		39	89	Dec
Shannon & Fergus Estuary [4, 5]	37	51		40				20	40	Jan

* Low-quality count not included in the calculation of the mean.

** The total number of feral birds occurring at Lough Swilly remains unknown. Accurate counts are hampered by mixing of birds of Icelandic and feral origin. The best available count of ferals at Lough Swilly was in October 2017 which estimated 870 individuals.

[4]Aerial census data.

[5]Site did not meet the thresholds of regularly supporting 20 or more birds during the 2001/02 to 2008/09 period.

4.10 Barnacle Goose *Branta leucopsis* Gé ghiúrainn

E. Greenland (br)

International threshold:	810	**Population Change (%):**	
All-Ireland threshold:	160	5 year:	-7.2[b]
Population size (2011-2016):		10 year:	+32.7[c]
All-Ireland:	16,240[a]	25 year:	+101.1[d]
ROI:	16,237[a]	Historical:	+113.9
Associated with SPA network:	14,450[a]		

[a] from Doyle *et al*. (2018).

Population change based on the comparison of the 2018 population estimate (Doyle *et al*., 2018) with: [b] 2013 census (Crowe *et al*., 2014); [c] 2008 census (Walsh *et al*., 2008); [d] 1993 Census (Merne & Walsh, 1994); [e] 1988 census spring (Merne & Walsh, 1994).

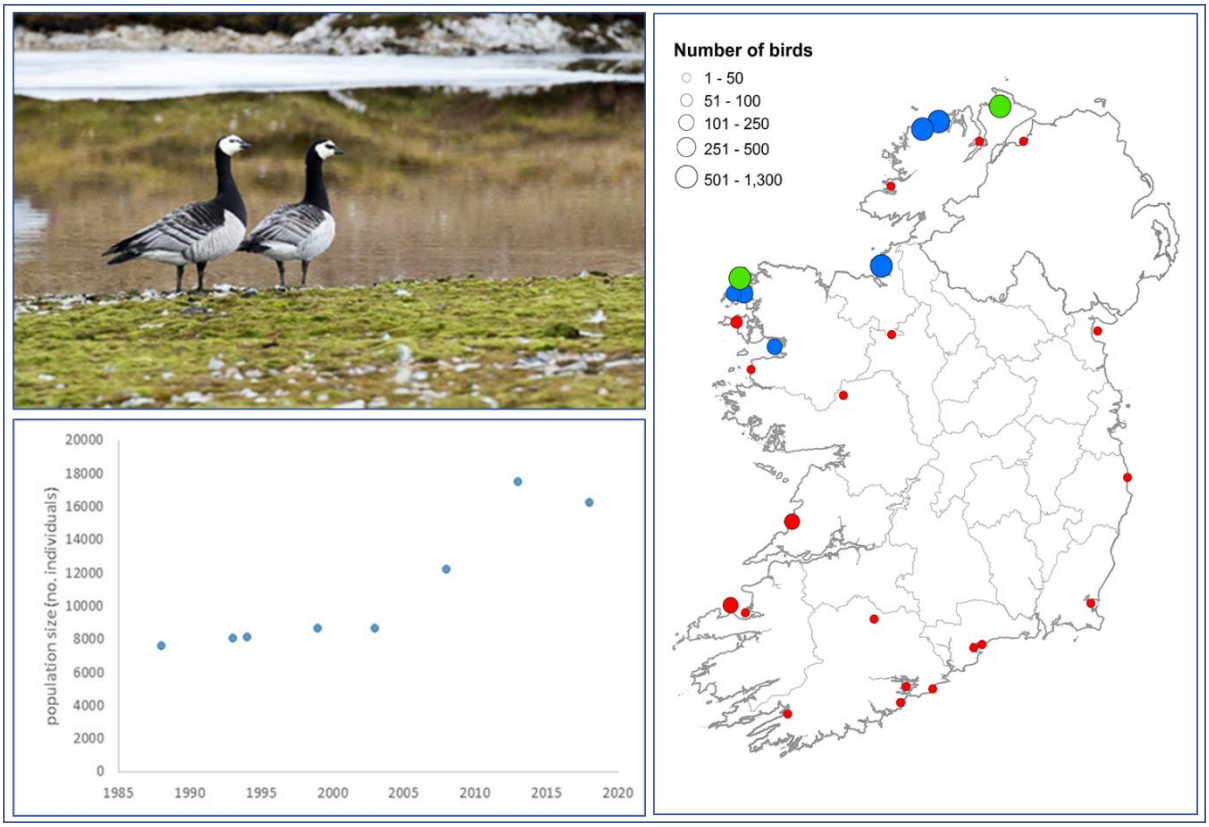


Figure 11 Distribution map and graphed population trend for Barnacle Goose. The distribution map illustrates sites supporting numbers of international importance (green circles), national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend graph illustrates the population size obtained from census data 1988-2018 (Photo: Mark Carmody).

The Greenland-breeding Barnacle Goose population winters exclusively in Ireland and Scotland (Mitchell & Hall, 2013). In Ireland, Barnacle geese are almost exclusively found on coastal pasture fields and offshore islands in the north-west. Because of this distribution, they are not fully accounted for during core I-WeBS counts. Regular coordinated censuses of the population have been carried out on the wintering grounds since 1959, through both aerial and ground counts (Boyd, 1961; Doyle *et al*., 2018). In recent decades, censuses have been carried out on a five-yearly basis. As a result of the spring 2018 census, the flyway population was estimated at 72,162 (Mitchell & Hall, 2018), a 10.5% decrease on the census conducted in 2013 (Mitchell & Hall, 2013; Crowe *et al*., 2014) and in accordance with a flyway population decline in recent years (Doyle *et al*., 2018).

Barnacle geese were recorded at 28 sites during I-WeBS counts during the current period, and at 31 and 33 sites during the 2013 and 2018 censuses, respectively (Crowe *et al*., 2014; Doyle *et al*., 2018). Based on I-WeBS counts, Trawbreaga Bay and Termoncarragh and Annagh Marsh were identified as supporting numbers of international importance. In addition, six sites supported numbers of national importance (Table 10a).

The 2018 census further identified the Inishkea Islands and Cross Lough in north-west Mayo, Ballintemple in Sligo and Trawbreaga Bay as having supported numbers of international importance in March 2018 (Doyle *et al*., 2018) (Table 10b). On a county basis, Mayo supported the largest proportion of birds, closely followed by Donegal and Sligo, the latter of which supported a single flock consisting of over 27% of the Irish population (Doyle *et al*., 2018). Eleven sites supported numbers of national importance during the census, six of which were offshore islands and the rest of which were on or close to headlands in Mayo and Donegal. Doyle *et al*. (2018) note the risks of assuming that a spring census provides a true representation of the wintering range of Barnacle geese in Ireland, when the species might be expected to be moving northward in advance of migration at that time of year.

Table 10a Table showing sites supporting internationally and/or nationally important numbers of Barnacle Goose based by the ranked mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of international importance										
Trawbreaga Bay	579	668	1,300	518*				1,300	1,300	
Termoncarragh & Annagh Marsh	697	750	780	1,677	1,200	600		1,064	1,677	Dec
Sites supporting numbers of national importance										
Drumcliff Bay Estuary[3]	1,570	2,500	2,330	142	47	710	750	796	2,330	Nov, Feb
Dunfanaghy New Lake					750	650	920	773	920	Mar
Ballyness Bay					720			720	720	
Blacksod & Tullaghan Bays	769	492*	410	458	867	680	24	488	867	Nov
Mullet West	373	242*	52	352	300	174		220	352	Nov
Clew Bay			160	245	270	160	11	169	270	Jan, Mar

Sites that supported numbers of international importance during the former period but no data were available for the current period: Rathlin O'Birne.

Sites that supported numbers of national importance during the former period but no data were available for the current period: Inishkea Islands; Inishtraull Island.

* Low-quality count not included in the calculation of the mean.

Table 10b Sites not listed in Table 10a that supported internationally and/ or nationally important numbers of Barnacle Goose based on the aerial counts from the spring 2018 census (Doyle *et al.*, 2018).

Site	Spring 2018 aerial census count
Other sites supporting numbers of international importance	
Ballintemple	4,410
Inishkea Islands	2,330
Trawbreaga Bay	1,775
South Mayo Coast (Cross Lough)	804
Other sites supporting numbers of national importance	
Inishshark	638
Birmore Island	587
Dooey	450
Malin Head	380
Doagh	300
Tory Sounds Islands (Inishdooey Island)	280
Croaghnakeela Island	252
Annagh Head	243
Oilean MacDara (St. MacDara's Island)	221
Tiraun	184
Moynishmore Island	169

4.11 Canada Goose *Branta canadensis* Gé Cheanadach

Feral population and small numbers of wild migratory birds

International threshold: -

All-Ireland threshold: -

Mean/ Peak (2011/12 – 2015/16): 511/719

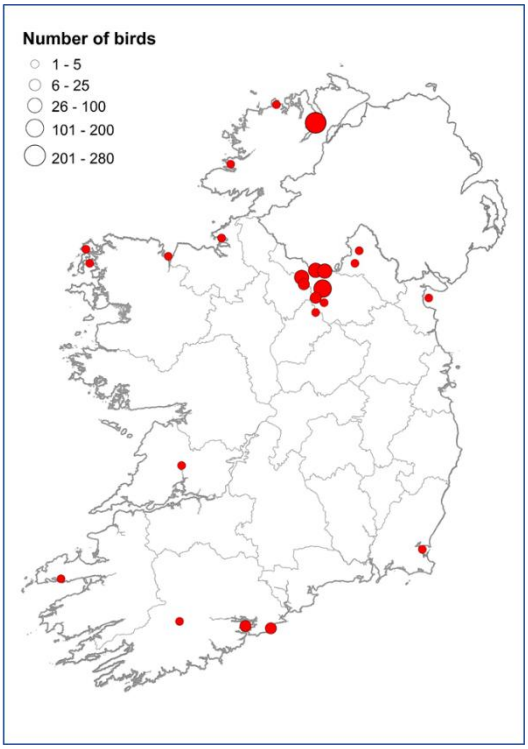


Figure 12 Distribution map for Canada Goose showing peak numbers recorded at sites between 2011/12 and 2015/16 (Photo: Terry Flanagan).

Wetlands International (2018) recognise 14 populations of Canada Goose, and an additional four populations of the similar Cackling Goose *Branta hutchinsii.* Small numbers of wild Canada (and Cackling) geese are known to occur in Ireland on an annual basis, usually associating with 'carrier' species such as Barnacle Goose or Greenland White-fronted Goose . (e.g. Barton, 2017; Hobbs, 2016; Carmody & Hobbs, 2015). A review of records by the Irish Rare Birds Committee, in light of recent taxonomic reviews by the American Ornithologists' Union (AOU), determined that the *canadensis* and interior subspecies of Canada Goose are potential vagrants to Ireland. *Branta canadensis canadensis* most closely resembles the feral population of Canada geese in Ireland however, making it difficult to confidently identify a *canadensis* of North American origin unless it is ringed or through genetic analysis. (IRBC, 2013). The Cackling Goose was previously considered a 'small' form of Canada Goose, but has since been recognised and accepted as a separate species by the AOU and British Ornithologists' Union (BOU) (IRBC, 2013). Based on size alone, it is not too difficult to separate Cackling Goose from Canada Goose in Ireland. The 2013 review by the Irish Rare Birds Committee accepted 19 records of Cackling Goose and 29 of Canada Goose as 'presumed to be of North American origin from 1969 to 2009'.

The breeding distribution in the recent British and Irish Bird Atlas found a 600% increase in their breeding range over the 40 years to 2011, and an index increase of 0.15 from 1991 to 2011 (Balmer *et al*., 2013). I-WeBS counts are likely to provide a good indication of numbers and current wintering range, but targeted survey coverage during the breeding season is needed to confidently assess the current size of the population (Lovatt 1999). No data on breeding productivity or brood size is currently collated in Ireland.

Although Canada geese from North American-breeding populations do occur in Ireland in small numbers, the vast majority of birds in Ireland are resident and descended from feral/released birds.

Canada geese were recorded at 27 sites during the current period. Five sites recorded the species on a regular basis (Table 12) with Lough Swilly supporting the highest numbers overall based on mean and peak numbers.

Table 12 Table showing sites that supported Canada Goose in five or more seasons between 2009/10 and 2015/16

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Lough Swilly	323	260	355	245	8	352	438	280	438	Sep, Nov
Lough Oughter Complex		112	96	152	202	30		120	202	
Cork Harbour	9	12	14	14	10	7	7	10	14	Nov
Ballycotton Shanagarry	14	3	14	10	9			7	14	Sep
An Trá Beg	8		12		2		10	5	12	Nov

Other sites recorded less than five seasons (peak count 2011/12 – 2015/16):

Adra Lough (20), Annagose Lough (3), Ballinamore Lakes (16), Ballyallia Lake (2), Blacksod & Tullaghan Bays (1), Castlemaine Harbour & Rossbehy (2), Drumcliff Bay Estuary (3), Dundalk Bay (1), Dunfanaghy New Lake (3), East Ballinamore Lakes (43), Finn-Lacky Catchment (5), Inishcarra Reservoirs (1), Killala Bay (1), Lough Gowna (2), North Wicklow Coastal Marshes (1), River Erne & lakes north of Belturbet (138), River Erne: Oughter - Gowna (7), Rogerstown Estuary (1), Sheskinmore Lough (1), Termoncarragh & Annagh Marsh (2), Wexford Harbour & Slobs (1), Woodford River Lakes (92).

4.12 Light-bellied Brent Goose *Branta bernicla hrota* Cadhan

hrota, E. Canadian High Arctic (br)

International threshold:	400	**Population Change (%):**	
All-Ireland threshold:	350	5 year:	-15.5[b]
Population size (2011-2016):		10 year:	-10.2[c]
All-Ireland:	35,150[a]	20 year:	+96.1[d]
ROI:	30,295[a]	Historical:	+75.1[e]
Associated with SPA network:	22,405[a]		

[a] 2017 data from the Irish Brent Goose Research Group.

Population change based on the comparison of the 2017 all-Ireland population estimate with: [b] 2012 census; [c] 2007 census, [d] 1997 census, [e] mid 1980s population estimate (Sheppard, 1993).

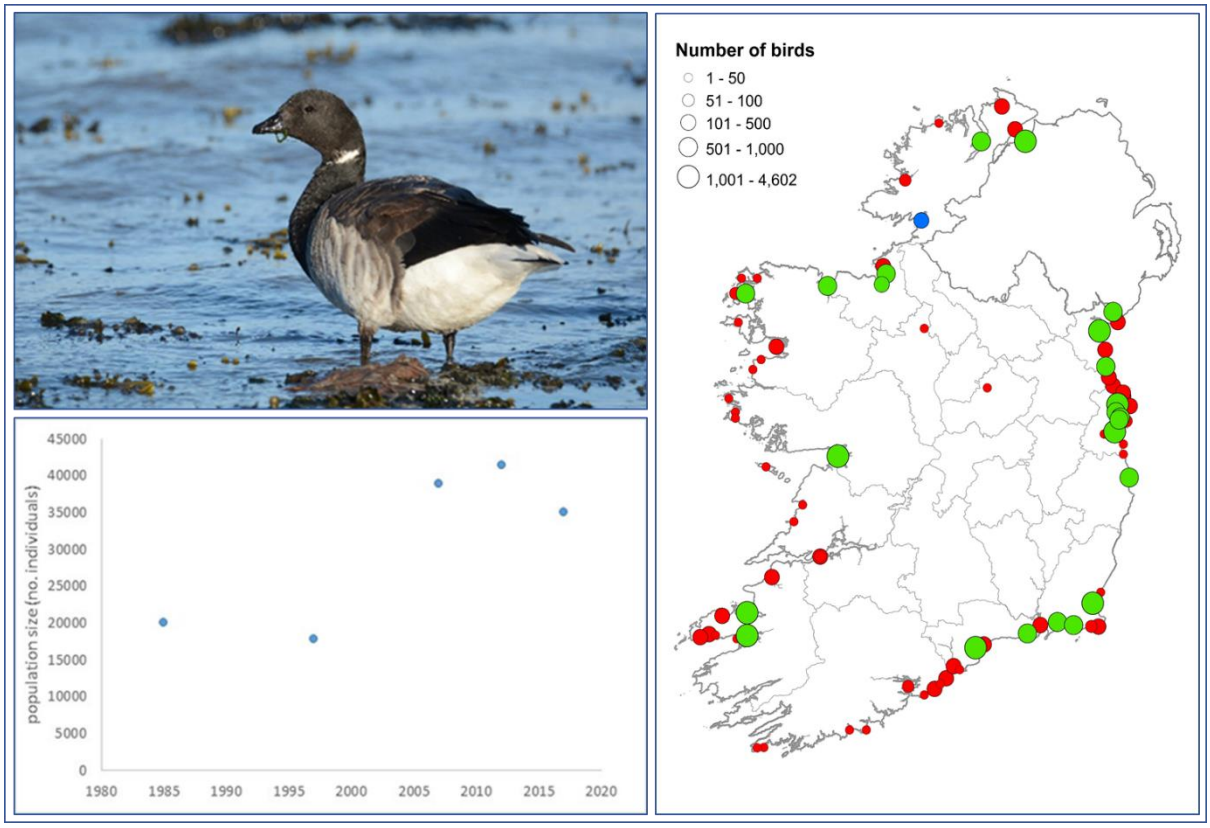


Figure 13 Distribution map and graphed population trend for Light-bellied Brent Goose. The distribution map illustrates sites supporting numbers of international importance (green circles), national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend graph illustrates the population size obtained from census data 1985-2017 (Photo: Brian Burke).

There are eight populations of the Brent Goose (Wetlands International, 2018), including three populations of the Light-bellied *hrota* subspecies. The Light-bellied Brent Goose population (hereafter Brent Goose) that breeds in Canada's eastern Queen Elizabeth Islands winters mostly in Ireland, with small numbers in Britain, France, the Channel Islands and Spain. Since winter 1996 the Irish Brent Goose Research Group has coordinated autumn and spring censuses of the East Canadian High-Arctic

Light-bellied Brent Goose on its wintering grounds to monitor population size, productivity and mark and resight individuals for further study. Since 2001 the group has marked over 5,000 geese and over 200,000 sightings have been recorded (G. McElwaine, pers. comm.).

The population has shown huge increases in the medium and long-term, although some years of almost zero productivity mean there has been some fluctuation in numbers in the short-term. Numbers reached a peak of over 48,000 birds in winter 2011/12 but had fallen as low as 32,000 birds three years later. In the last three years (autumn 2015-2017) the population has numbered 35,000-40,000 birds. In recent years almost total breeding failure was recorded in autumn 2009, 2013 and 2017 (Colhoun *et al*., 2017); but percentage young exceeded 20% in autumns 2004, 2007 and 2011 (Irish Brent Research Group, pers. comm.), with varying levels of success in between.

The bulk of the population congregates at Strangford Lough upon arrival from staging grounds in Iceland, usually in the last few days of August. Over the following weeks the geese move on to other sites where they will spend the majority of the winter. They were recorded at 80 I-WeBS sites during the current period, a slight increase from 75 sites during the previous period (Boland & Crowe, 2012). A total of 24 sites supported numbers of international importance, only one of which (Ballymacoda) was not of similar importance during the previous period. At site level, some flocks experienced notable increases in recent seasons (e.g. Dublin Bay, Castlemaine Harbour & Rossbehy) whilst others declined by equally notable numbers, although low productivity in recent years is likely a significant factor in many of these declines. Despite hosting a similar mean count of Brent geese as in the previous period, the numbers at Donegal Bay are now of national rather than international importance. Of the two sites that no longer supported significant numbers, Trawbreaga Bay received low levels of survey coverage during the current period. Improved survey coverage in the coming years might therefore reveal this site to be of similar importance to the previous period.

Brent geese are well-known to feed on recreational grasslands from mid-winter onwards (Inger *et al*., 2006), which means many flocks are unlikely to be recorded during core I-WeBS counts. Recent work as part of a Natura Impact Statement (Scott Cawley, 2017) identified 113 terrestrial inland feeding sites used by Brent geese in Dublin City and its environs from 2012/13 to 2016/17. The abundance of these foraging sites within the Dublin Bay catchment is likely a factor in the increased numbers in Dublin Bay in recent years, despite poor productivity and declines in many other areas. Eight of these feeding sites recorded numbers of international importance in the five-year period examined (Scott Cawley, 2017).

Table 13 Table showing sites supporting internationally and/or nationally important numbers of Light-bellied Brent Goose ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of international importance										
Dublin Bay	5,536	3,292	4,102	6,134	3,717	4,862	4,195	4,602	6,134	Nov
Tralee Bay, Lough Gill & Akeragh Lough	4,043	3,118	3,943	5,962	2,075	1,323	1,962	3,053	5,962	Feb
Lough Foyle †	3,862	2,652	2,927	3,722	2,712	2,500	3,399	3,052	3,722	
Wexford Harbour & Slobs	2,100*	1,900*	4,020	1,448	2,758	1,890	1,010	2,225	4,020	Jan
Rogerstown Estuary	2,749	1,051	2,661	1,395	2,217	1,047	2,662	1,996	2,662	Dec
Dundalk Bay	1,435	722	1,802	1,861	1,800	1,462	2,337	1,852	2,337	Dec
Dungarvan Harbour	1,867	1,110	1,516	1,749	1,143	1,062	1,018	1,298	1,749	Jan

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Inner Galway Bay	1,419	1,047	1,936	1,234	1,030	605	847	1,130	1,936	Mar
Castlemaine Harbour & Rossbehy	753*	1,350	1,278	1,284	1,091	1,169	804	1,125	1,284	Nov, Dec
Broadmeadow (Malahide) Estuary	898	1,411	943	1,980	710	464	824	984	1,980	Jan
Tramore Back Strand	521*	814	986	1,112	828	641		892	1,112	Jan
Hick's Tower & Robswall	257	325	835					835	835	
Bannow Bay	2158		1455		943	478	404	820	1,455	
North Wicklow Coastal Marshes	390	780	1,120	245*	703	20*	570	798	1,120	Mar
Lough Swilly	646	581	689	984	594	450	424	628	984	Mar
Blacksod & Tullaghan Bays	913	492*	586	1,426	476	322	246	611	1,426	Jan, Feb
Sligo Harbour	433	435	263	1,139	572	597	477	610	1,139	Nov, Jan
Carlingford Lough †		160	278	1,320	477	379	581	607	1,320	
The Cull & Killag (Ballyteige)	480	216	308	545	184	602	946	517	946	Dec, Mar
Killala Bay	435	313	315	663	711	564	312	513	711	Dec
Baldoyle Bay	956				580	588	342	503	588	Dec
Boyne Estuary	345	585	675	953	100	540	238	501	953	Nov, Mar
Ballysadare Bay	428	50	398	513	443	500	362	443	513	Jan
Ballymacoda [1]	4*		755	347		177	2*	426	755	Mar
Sites supporting numbers of national importance										
Donegal Bay [3]	427	386	294	573	502	321	183	375	573	Jan
Sites no longer supporting numbers of international importance										
Trawbreaga Bay	392	68		573				287	573	
Lady's Island Lake	310	670	541	140	248	28		191	541	Mar

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[3]Site demoted (from supporting numbers of international importance to numbers of national importance) since the 2001/02 to 2008/09 period.

4.13 Shelduck *Tadorna tadorna* Seil-lacha

N. W. Europe (br)

International threshold:	2,500	**Population change (%):**	
All-Ireland threshold:	100	5 year:	-9.9
Population size (2011-2016):		12 year:	-17.3
All-Ireland:	10,160	22 year:	-23.0
ROI:	6,378	Historical:	-16.4
Associated with SPA network:	6,149	Average annual change:	-1.5

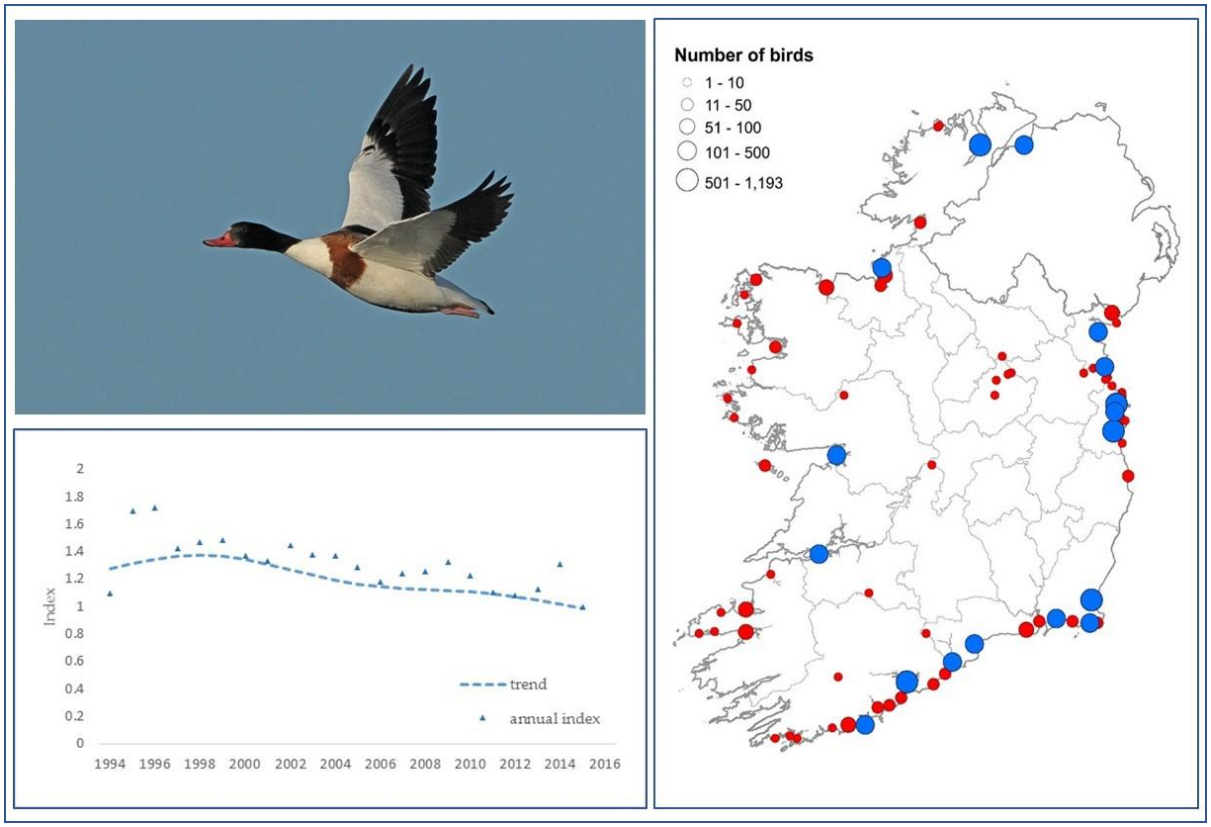


Figure 14 Distribution map and graphed population trend for Shelduck. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Colum Clarke).

Ireland's breeding and wintering Common Shelduck (hereafter Shelduck) belong to the population that breeds across north-west Europe and winters in west Europe. The flyway population is stable (Wetlands International, 2018). Numbers have shown a slight but steady decline in Ireland since the mid-1990s, and this trend is consistent with that shown in Britain, while numbers have been in decline in Northern Ireland since the mid 2000s (Frost *et al*., 2018).

The species is notable for forming large aggregations of moulting birds at the end of the breeding season in late summer. Traditionally almost all western European Shelduck were thought to have migrated to the German Wadden Sea to moult where they have been systematically counted since the

late 1980s. However, recent surveys suggest that about a quarter of the moulting Shelduck in the Wadden Sea have now shifted from the German to the Dutch Wadden Sea (JMMB, 2013). In addition, late summer moulting concentrations are also known to occur in the UK, notably on the Humber Estuary, The Wash, Bridgwater Bay in the Severn Estuary, and the Firth of Forth (Patterson, 1982). In Ireland, small numbers of Shelduck are recorded during the early autumn, and build up from October through to the mid-winter period. Shelduck are widely dispersed and were recorded at 80 sites during the current period, including 17 sites that supported numbers of national importance. Cork Harbour and Dublin Bay remain the top ranked sites; numbers at the latter increased slightly in comparison to the former period. Numbers have declined at Dundalk Bay and the decline at Carlingford Lough (NI) has resulted in this site being removed from the list of significant sites. Five sites are newly listed as being of significance largely as a result of the drop in 1% threshold from 150 to 100.

Table 13 Table showing sites supporting nationally important numbers ranked by the mean of peak counts of Shelduck between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Dublin Bay	1,142	821	603	731	961	2,927	744	1,193	2,927	Nov, Dec
Cork Harbour	952*	1,369*	1,021	1,281	1,241	1,073	955	1,114	1,281	Feb
Rogerstown Estuary	886	730	752	793	877	652	624	740	877	Dec, Feb
Lough Swilly	636	802	742	517	661	748	533	640	748	Feb, Mar
Wexford Harbour & Slobs	87*	243*	600	259	530	1,116	261	553	1,116	Nov, Feb
Dundalk Bay	742	447	265	199	463	254	455	327	463	Jan, Mar
Bannow Bay	393		366		201	369	353	322	369	Dec
Dungarvan Harbour	269	399	341	297	337	348	231	311	348	Feb
Shannon & Fergus Estuary [4]	499	408	279	210				245	279	Mar
Broadmeadow (Malahide) Estuary	341	479	8	262	120	222	303	183	303	Nov
Lough Foyle †	122	139	209	140	129	195	218	178	209	Mar
Boyne Estuary [1]	83	118	151	218	150	182	186	177	218	Feb
Courtmacsherry Bay, Broadstrand Bay & Dunworley [1]	113	227	129	165	135	146	150	145	165	Dec, Feb
Blackwater Estuary [1]	79	8*	132	156	198	120	94	140	198	Feb, Mar
Drumcliff Bay Estuary [1]	133	65	124	84	94	209	155	133	209	Feb
Tacumshin Lake	134	98	178	136	122	97	72	121	178	Mar
Inner Galway Bay [1]	104	92	88	83	90	122	115	100	122	Mar
Sites no longer supporting numbers of national importance										
Baldoyle Bay	238				52	97	88	79	97	
Carlingford Lough †	278	237	292	37	37	26	26	84	292	Mar

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[4]Aerial census data.

4.14 Wigeon *Mareca penelope* Rualacha

Western Siberia, N.W. & N.E. Europe (br)

International threshold:	140,000	**Population change (%):**	
All-Ireland threshold:	560	5 year:	-4.9
Population size (2011-2016):		12 year:	-24.0
All-Ireland:	55,730	22 year:	-39.2
ROI:	50,452	Historical:	-43.6
Associated with with SPA network:	38,514	Average annual change:	-1.8

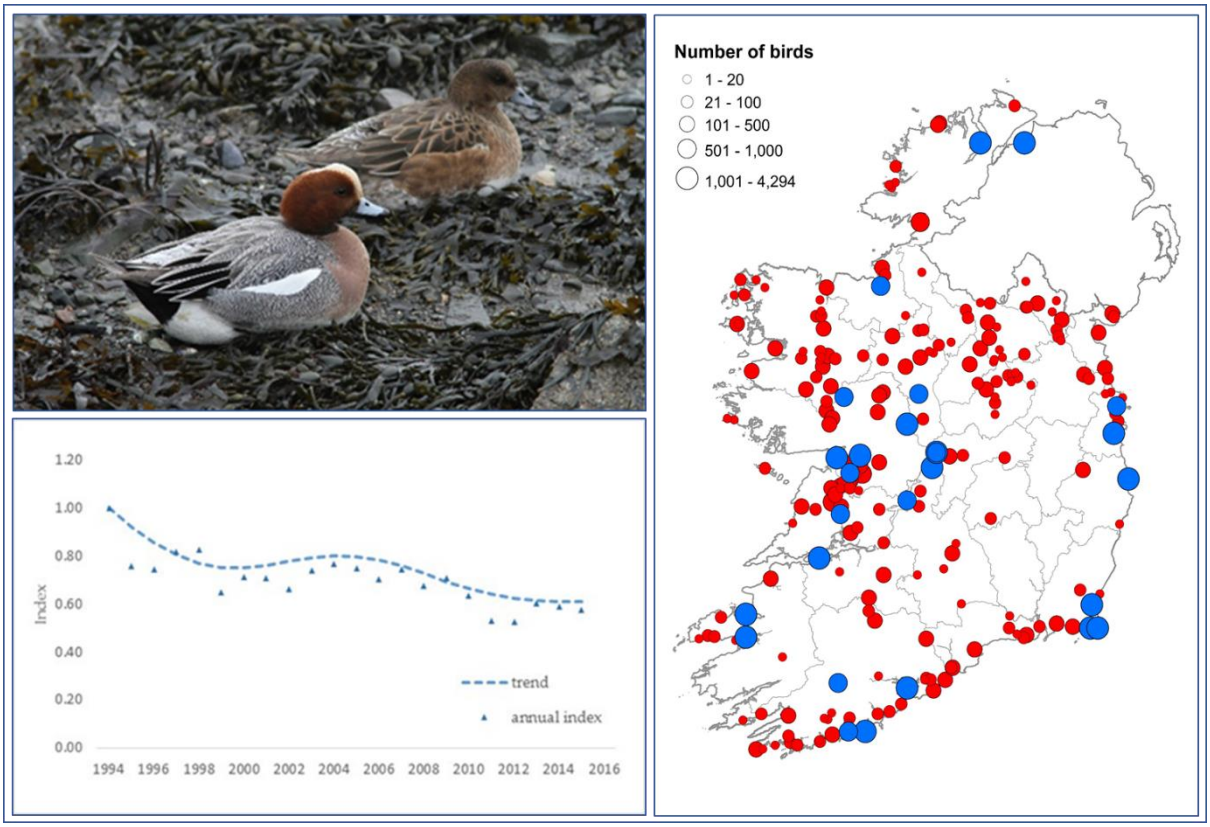


Figure 15 Distribution map and graphed population trend for Wigeon. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Dick Coombes).

The population of Eurasian Wigeon (hereafter Wigeon) that winters throughout north-west Europe breeds across north-west and north-east Europe as far as western Siberia. This flyway population is in decline. Wintering populations of Wigeon in Republic of Ireland and Northern Ireland have shown long term declines, while long-term increases have been recorded in Britain (Frost *et al*., 2018).

Numbers of Wigeon in Ireland build up from early autumn and peak in January. Wigeon are widespread on a variety of coastal and inland complexes, and they were recorded at 243 sites during the current period. Some 28 sites supported numbers of national importance including nine sites that have been promoted to this listing. Little Brosna Callows and Tacumshin Lake remain highly ranked

sites although declines in numbers are evident at both. Numbers at Wexford harbour & Slobs, ranked second most important during the former period, have declined substantially. Numbers have similarly declined at Lough Foyle (NI). Numbers for the River Suck (aerial counts) have increased while a substantial increase at Castlemaine Harbour & Rossbehy is likely due to improved coverage.

In Northern Ireland, Lough Foyle, Loughs Neagh & Beg and Strangford Lough remain the top ranked sites based on numbers for this species (Frost *et al*., 2018).

Table 14 Table showing sites supporting nationally important numbers of Wigeon ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Little Brosna Callows			4,291	3,425	5,273	4,185	1,711*	4,294	5,273	Jan
Little Brosna Callows [4]	1,455	2,375	2,350	5,700				4,025	5,700	
Tacumshin Lake	3,350	3,500	3,000	4,620	2,350	3,790	5,000	3,752	5,000	Oct, Dec
Rahasane Turlough	4,000	3,500	2,300	3,500*	5,100	3,100	2,700	3,300	5,100	Jan
River Suck [4]	2,868	3,146	3,385	3,127				3,256	3,385	
Castlemaine Harbour & Rossbehy [1]	298*	3,038	761	2,128	4,007	4,774	3,880	3,110	4,774	Oct
Shannon Callows [4]	900	4,702	3,676	2,023				2,850	3,676	
Shannon & Fergus Estuary [4]	1,933	1,976	1,789	2,594				2,192	2,594	
Lough Foyle †	1,273	1,409	782	1,830	1,663	1,349	3,395	1,804	3,395	Sep, Oct
Inner Galway Bay	2,211	1,042	3,564	1,325	1,557	1,181	1,119	1,749	3,564	Jan
Lough Swilly	1,313	1,343	1,173	971	2,206	2,228	2,122	1,740	2,228	Nov
Wexford Harbour & Slobs	6,450*	3,420*	2,113	1,606	2,560	792	1,000	1,614	2,560	Jan
Courtmacsherry Bay, Broadstrand Bay & Dunworley	962	1,478	1,088	1,667	1,599	992	1,762	1,422	1,762	Dec
Cork Harbour	1,236*	1,388*	1,508	1,056	1,503	1,578	1,245	1,378	1,578	Jan
Tralee Bay, Lough Gill & Akeragh Lough	814	745	269	434	1,520	2,550	1,446	1,244	2,550	Oct
Lady's Island Lake [1]	2,492	622	1,200	919	942	844	1,219	1,025	1,219	Feb
Dublin Bay [1]	1,911	806	610	445	691	2,201	1,106	1,011	2,201	Nov
North Wicklow Coastal Marshes	771	1,602	1,253	510*	849	845*	913	1,005	1,253	Feb
Rogerstown Estuary	690	490	813	585	686	1,342	1,532	992	1,532	Jan, Feb
Southern Roscommon Lakes	837	392	824	1,145	1,247	864	439	904	1,247	Jan
Ballyallia Lake [1]	631	532	629	666	784	1,122	921	824	1,122	Dec
North Central Galway Lakes [1]	1,020*	1,070	637	397	650		1,315	750	1,315	Jan

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Shannon Callows	732	1,398	970	641		1,351		741	1,351	Dec, Jan, Feb
Inishcarra Reservoirs	1,168	287	102	1,512	1,067	85*	277	740	1,512	Jan
Clonakilty Bay [1]	425	354	641	685	981	499	783	718	981	Nov, Jan
Ballysadare Bay [1]	291	201	483	369	910	565	793	624	910	Jan
Cahermore Turlough [1]		1	406	410	557	533	1,000	581	1,000	Dec, Jan
Lough Derg (Shannon) [1,4]	1,013	340	461	662				562	662	Jan
Sites no longer supporting numbers of national importance										
Dundalk Bay	1,073	1,116	615	399	452	269	239	475	639	
Blackwater Callows	973		533	234	411	104		321	533	
Kilcolman Marsh	335	135	105	200	300	150	120	175	300	

Sites that supported numbers of national importance during the former period but no data were available for the current period: Lough Ree and Cahore Marshes.

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[4]Aerial census data.

4.15 Gadwall *Mareca strepera* Gadual

strepera, N.W. Europe (br)

International threshold:	1,200	**Population change (%):**	
All-Ireland threshold:	20	5 year:	-39.3
Population size (2011-2016):		12 year:	-3.1
All-Ireland:	890	22 year:	+54.9
ROI:	515	Historical:	+55.0
Associated with SPA network:	284	Average annual change:	+2.0

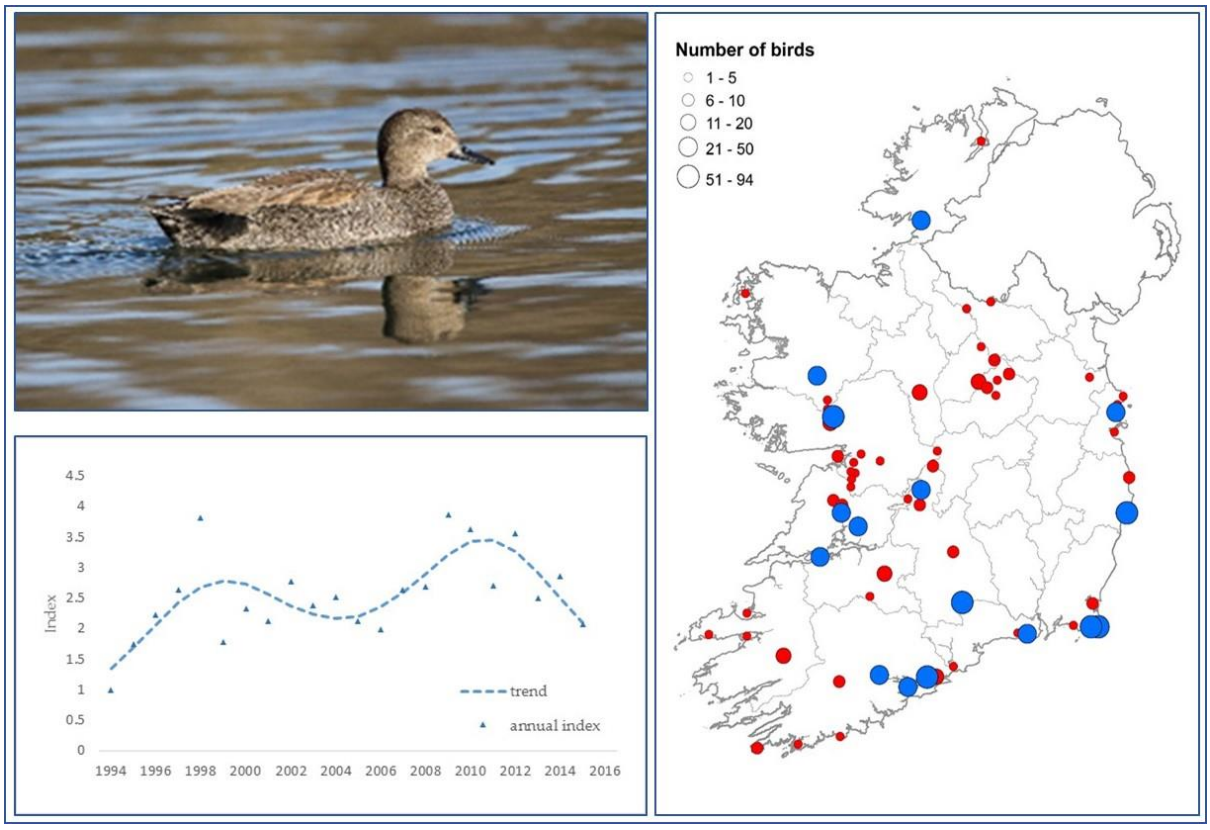


Figure 16 Distribution map and graphed population trend for Gadwall. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Mark Carmody).

Gadwall that occur in Ireland belong to the population that breeds across north-west Europe and spends winter in west Europe. This population has an increasing trend (Wetlands International, 2018). This species has a positive trend in Ireland across the long-term although a short term decline is evident. Gadwall has also shown continued increase in Britain since the late 1970s. Following a decline in numbers in Northern Ireland since the early 1990s, numbers have increased (Frost *et al*., 2018).

Gadwall were recorded at 71 sites during the current period including 16 sites that supported numbers of national importance. Lady's Island Lake was the top ranked site with a mean number more than double that reported for the former period, while Buckroney Fen, the second highest

ranked site, is newly listed as a site of significance. Numbers at Lough Carra and Lough Corrib have declined, the latter no longer qualifying as a significant site for this species. While numbers at the Corofin Wetlands appear to have declined, poor count coverage in recent seasons means that the true status for this site is unknown.

Table 15 Table showing sites supporting nationally important numbers of Gadwall ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Lady's Island Lake	129	32	149	34	147	22	117	94	149	Sep
Buckroney Fen [1]			79					79	79	
Tacumshin Lake	132	158	57	88	43	80	47	63	88	Dec
Doolough Headford (Turloughcor)	18	50	94	107	10	50	30	58	107	Feb
Lough Aderry	3	25*	19	66	77	65	59	57	77	Dec
Marlfield Lake	41	40	41	62				52	62	
Pat Reddan's Lake	29	27	30	42	34	71	19	39	71	Jan
Blarney Lake [1]						35		35	35	
Tramore Back Strand [1]	6*	62	28	37	43	25		33	43	Jan
Shannon & Fergus Estuary [1]		66	13	14	49	33	42	30	49	Dec
Lough Carra	25	20	30					30	30	
South East Clare Lakes [1]	4*	52	25	34	38	36	14	29	38	Feb
Broadmeadow (Malahide) Estuary [1]		2		120	4			25	120	Sep, Nov
Ballyallia Lake [1]	30	71	18	42	18	25	10	23	42	Dec
Cork Harbour [1]	8*	13*	22	12	15	36	25	22	36	Dec, Feb
Donegal Bay [1]				40		2		21	40	Sep, Oct
Sites no longer supporting numbers of national importance										
Lough Corrib	97	19	23*	43	14	8	4	17	43	
Corofin Wetlands	82	12		13			34	9	34	Oct, Jan

Sites that supported numbers of national importance during the former period but no data were available for the current period: Castlemartyr Lake.

* Low-quality count not included in the calculation of the mean.

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

4.16 Teal *Anas crecca* Praslacha

crecca, N. & N.W Europe (br)

International threshold:	5,000	**Population change (%):**	
All-Ireland threshold:	360	5 year:	-6.0
Population size (2011-2016):		12 year:	-2.9
All-Ireland:	35,740	22 year:	+4.1
ROI:	27,644	Historical:	-
Associated with SPA network:	20,950	Average annual change:	+0.1

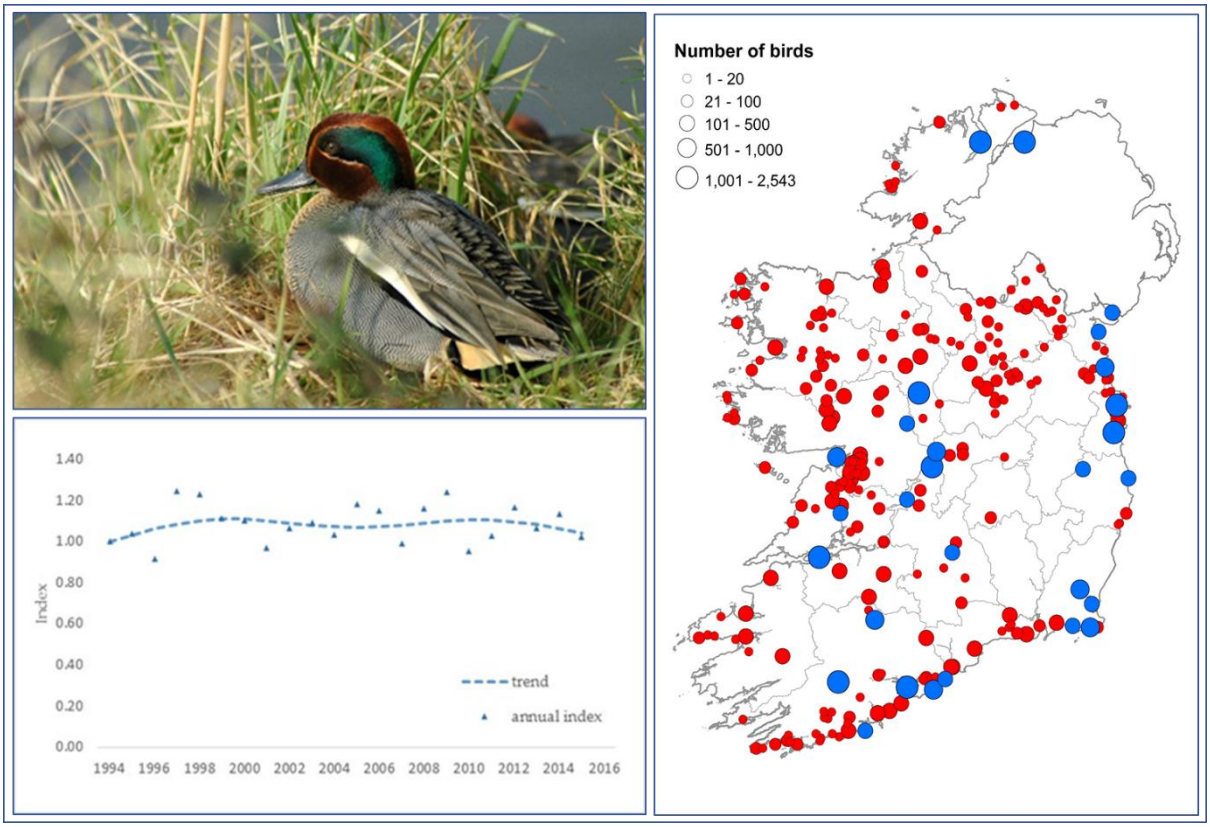


Figure 17 Distribution map and graphed population trend for Teal. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Brian Burke).

One of three recognised populations of Common Teal (hereafter Teal) breeds across north and north-west Europe and winters across north-west Europe. This population is increasing at the flyway scale. Teal are resident and a winter migrant in Ireland and numbers have increased over the long-term although a recent short-term decline is now evident (Figure 17). Teal have a similarly positive trend in the UK (Frost *et al*., 2018).

Teal are very widespread in Ireland, occurring in a wide range of inland and coastal wetland habitats, including small lakes and ponds, bogs, drainage ditches and rivers, all of which are under-represented

during I-WeBS. Therefore, deriving accurate population estimates and thresholds for this species is particularly difficult. In the UK, it was estimated that 21% of Teal are missed during WeBS counts (Kershaw & Cranswick, 2003). The thresholds presented above should be treated as known underestimates.

Teal were recorded at 265 sites during the current period, and 28 sites supported numbers of national importance. Lough Swilly, Little Brosna Callows and Inishcarra reservoirs remain the top ranked sites with relatively stable numbers compared with the former period. Numbers at Lough Foyle (NI) have nearly doubled since the former period, while numbers at Rahashane Turlough and Blackwater Callows have declined to an extent that these sites no longer qualifies as significant. Numbers at Wexford Harbour & Slobs and Kilcolman Marsh have also declined substantially.

Table 16 Table showing sites supporting nationally important numbers of Teal ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Lough Swilly	2,203	2,399	2,625	1,791	3,045	3,059	2,196	2,543	3,059	Nov
Lough Foyle †	2,020	1,325	1,360	1,844	4,803	2,187	1,510	2,341	4,803	Dec, Jan
Little Brosna Callows			1,778	899	593	3,000	1,718*	1,568	3,000	Jan
Inishcarra Reservoirs	2,025	585	490	2,035	2,082	250*	534	1,285	2,082	Jan
Rogerstown Estuary	1,003	1,448	1,211	1,469	685	2,008	967	1,268	2,008	Nov, Jan
Shannon & Fergus Estuary [4]	373	945	1,283	1,218				1,251	1,283	
Cork Harbour	753*	1,216*	1,015	1,251	1,240	1,221	1,399	1,225	1,399	Jan, Feb
Dublin Bay	980	1,358	909	981	1,378	1,233	1,291	1,158	1,378	Dec, Feb
Southern Roscommon Lakes	754	268	1,147	903	1,316	1,108	531	1,001	1,316	Jan
Tacumshin Lake	1,280	980	945	950	1,017	1,090	1,000	1,000	1,090	Dec, Feb
Inner Galway Bay	1,054	952	1,854	1,382	594	635	529	999	1,854	Jan
River Slaney				862	262*			862	862	
Boyne Estuary [1]	385	806	423	1,125	462	841	533	677	1,125	Oct, Dec
Shannon Callows [1,4]	270	573	835	285				560	835	
Kilcolman Marsh	1,000	150	700	250	1,000	300	500	550	1,000	Jan
Ballycotton Shanagarry [1]	553	250*	585	551	340	416	614	501	614	Oct, Dec
Ballymacoda	215*	107*	549	411		524	166*	495	549	Nov
Courtmacsherry Bay, Broadstrand Bay & Dunworley [1]	431	442	469	537	583	421	387	479	583	Oct
Dundalk Bay	1,065	512	275	625	681	358	321	452	681	Jan
Wexford Harbour & Slobs	570*	656*	378	461	257	488	654	448	654	Jan
The Cull & Killag (Ballyteige) [1]	160	415	91	458	357	849	478	447	849	Nov

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Lough Derg (Shannon) [4]	242	161	445	448				447	448	
North Wicklow Coastal Marshes	552	502	346	213*	582	356*	369	432	582	Jan
Poulaphouca Reservoir [1]	154		758	551	220	167		424	758	
Cabragh Wetlands [1]	500	500	410	600	350	450	250	412	600	Nov, Jan
Ballyallia Lake [1]	500	181	466	351	481	402*	333	408	481	Jan, Feb
Carlingford Lough †	287	385	673	287	385	357	337	408	673	Jan
River Suck [1,4]	211	400	308	479				394	479	
Sites no longer supporting numbers of national importance										
Rahasane Turlough	1,000	300	550	320	83	400	100	291	550	
Blackwater Callows	568		445	168	43	126		196	445	

Sites that supported numbers of national importance during the former period but no data were available for the current period: Pollardstown Fen.

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[4]Aerial census data.

4.17 Mallard *Anas platyrhynchos* Mallard

platyrhynchos, N. Europe (br)

International threshold:	53,000	**Population change (%):**	
All-Ireland threshold:	280	5 year:	-11.8
Population size (2011-2016):		12 year:	-21.4
All-Ireland:	28,230	22 year:	-26.1
ROI:	18,810	Historical:	-
Associated with SPA network:	11,278	Average annual change:	-1.4

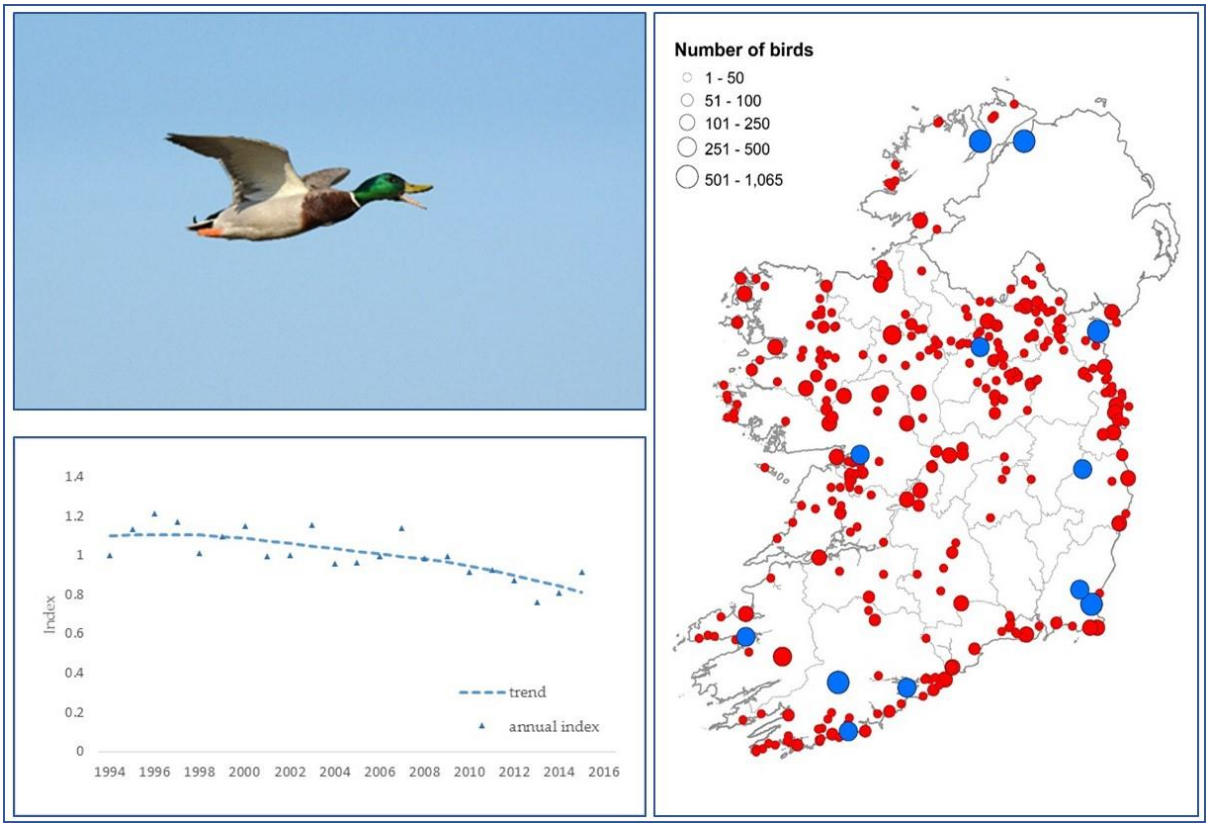


Figure 18 Distribution map and graphed population trend for Mallard. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Brian Burke).

Mallard that occur in Ireland belong to the population that breed across northern Europe and these have a non-breeding range that extends across north-west Europe, east to the Baltic. This population is stable (Wetlands International, 2018). Irish-breeding birds are resident, and are augmented each winter by migrants, possibly some from the Icelandic breeding population (Wernham *et al*., 2002). Numbers of Mallard have declined throughout I-WeBS, as well as in Northern Ireland and Britain. Frost *et al*. (2018) suggest that the declines in wintering Mallard could be related to fewer releases by shooting estates and/or perhaps short-stopping by Russian birds.

Mallard are widely distributed across freshwater and coastal wetlands and were recorded at 337 sites during the current period. Numbers of national importance were identified at twelve sites. Lough Swilly, Lough Foyle, Dundalk Bay and Wexford Harbour & Slobs are among the most important sites, consistent with the former period, but while numbers at Lough Swilly and Lough Foyle (NI) appear stable, numbers have declined at Dundalk Bay and Wexford Harbour & Slobs.

Loughs Neagh & Beg remains the most important site complex in Ireland for Mallard although numbers have declined (Frost *et al*., 2018).

Table 17 Table showing sites supporting nationally important numbers of Mallard ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Lough Swilly	524	1,179	973	516	536	1,769	1,533	1,065	1,769	Sep
Lough Foyle †	995	1,079	1,103	1,099	755	842	1,173	994	1,173	Oct
Dundalk Bay	807	694	840	766	964	538	1281	878	1,281	Sep
Wexford Harbour & Slobs	1,444*	1,374*	1,995	460	493	671	606	845	1,995	
Inishcarra Reservoirs	880	93	97	957	722	2*	493	567	957	Dec
Castlemaine Harbour & Rossbehy [1]	224*	495	357	444	360	283	436	376	444	Oct, Nov
Cork Harbour	285*	410*	400	319	323	389	439	374	439	Oct
Poulaphouca Reservoir [1]	121		727	283	198	213		355	727	
Lough Gowna [1]		8		220	444	244	358	317	444	
Rahasane Turlough [1]	220	400	350	290	224	191	488	309	488	Sep
Clonakilty Bay [1]	77	90	329	89	199	214	636	293	636	Oct
River Slaney [1]	55*			289	98*			289	289	

Sites that supported numbers of national importance during the former period but no data were available for the current period: Kiltullagh Lough.

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[4]Aerial census data.

4.18 Pintail *Anas acuta* Biorearrach

N. Europe & W. Siberia (br)

International threshold:	600	**Population change (%):**	
All-Ireland threshold:	20	5 year:	-32.5
Population size (2011-2016):		12 year:	-24.2
All-Ireland:	1,570	22 year:	-42.9
ROI:	1,017	Historical:	-
Associated with SPA network:	1,010	Average annual change:	-0.9

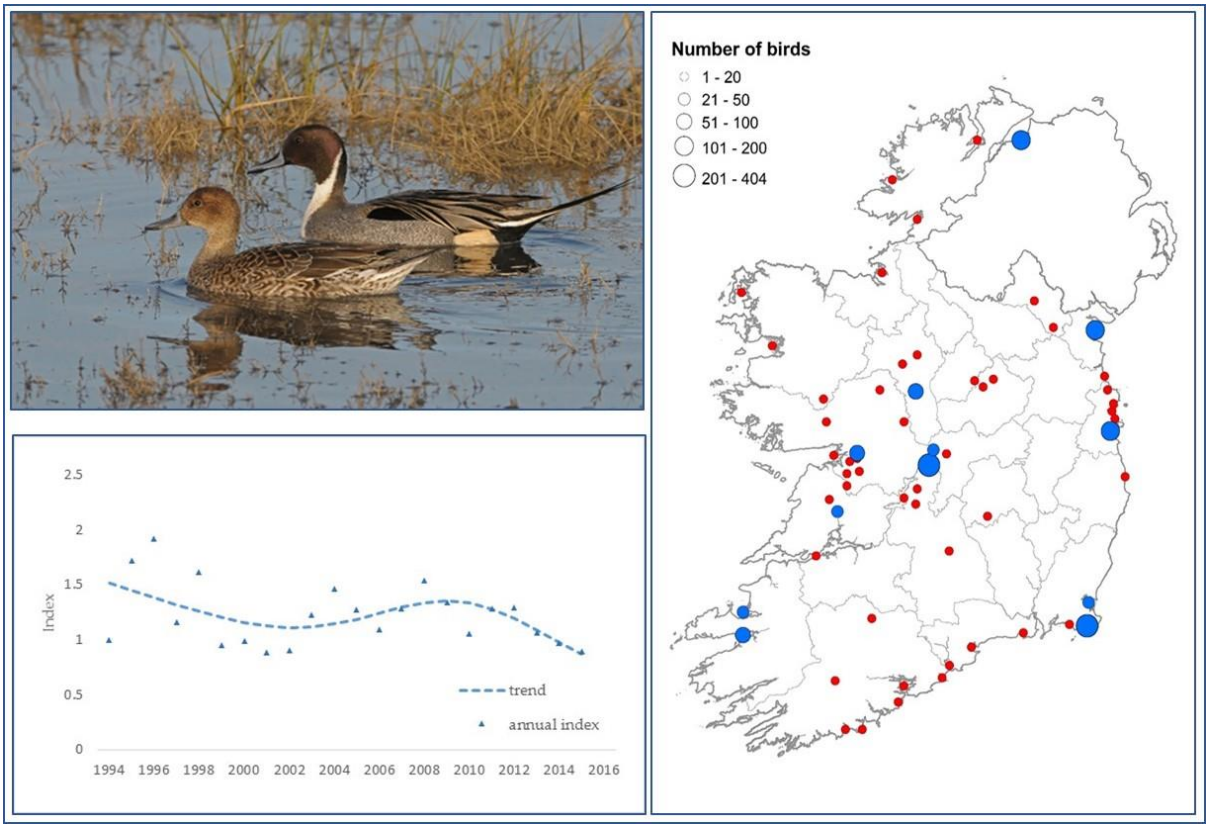


Figure 19 Distribution map and graphed population trend for Pintail. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Colum Clarke).

Wetlands International (2018) recognises three populations of the Northern Pintail (hereafter Pintail). The population that breeds across northern Europe and western Siberia, and winters in north-west Europe, including Ireland, has a stable population trend. While wintering numbers have fluctuated throughout I-WeBS, a long-term trend for decline is evident, contrasting to the trend for Northern Ireland where numbers have increased since the early 2000s.

The distribution of Pintail in Ireland is relatively localised, with birds distributed on a combination of inland and coastal wetland sites. They were recorded at 60 sites during the current period and 12 sites were identified to support numbers of national importance. The Little Brosna Callows, Dundalk Bay, Tacumshin Lake and Dublin Bay remain among the top most important sites in the Republic of Ireland and numbers at these sites appear stable with the exception of Dundalk Bay where a decline in numbers is evident. Numbers at the cross-border site Lough Foyle have increased, making this the third most important site for Pintail. Numbers at the Southern Roscommon Lakes have declined by half since the former period and a substantial decline is also evident for Wexford Harbour & Slobs.

Table 18 Table showing sites supporting nationally important numbers of Pintail ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Little Brosna Callows			641	232	240	275	630	404	641	Jan
Tacumshin Lake	254	170	111	280	338	176	262	233	338	Dec
Lough Foyle †	112	156	195	198	188	196	170	189	198	Jan, Feb
Dublin Bay	162	173	212	160	200	150	124	169	212	Feb
Dundalk Bay	110	78	120	213	132	191	149	161	213	Jan
Castlemaine Harbour & Rossbehy [1]	6*	46	120	45	122	110	56	91	122	Dec
Southern Roscommon Lakes	23		30	30	103	22	126	62	126	Jan
Rahasane Turlough	124	53	102	4	54	54	44	52	102	Nov
Wexford Harbour & Slobs	258*	124*	99	33	75	2	15	45	99	Dec
Shannon Callows [1]	6	6					180	45	180	Mar
Ballyallia Lake [1]	33	10	58	28	8	32	11	27	58	Dec
Tralee Bay, Lough Gill & Akeragh Lough [1]				34	49	36	9	26	49	Feb
Sites no longer supporting numbers of national importance										
Broadmeadow (Malahide) Estuary	66	72		29	6		15	10	29	
Baldoyle Bay	12				4	4		3	4	

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

4.19 Shoveler *Spatula clypeata* Spadalach

N., N.W. & Central Europe (br)

International threshold:	650	**Population change (%):**	
All-Ireland threshold:	20	5 year:	-38.0
Population size (2011-2016):		12 year:	-35.0
All-Ireland:	2,020	22 year:	-35.0
ROI:	1,865	Historical:	-
Associated with SPA network:	1,325	Average annual change:	-0.3

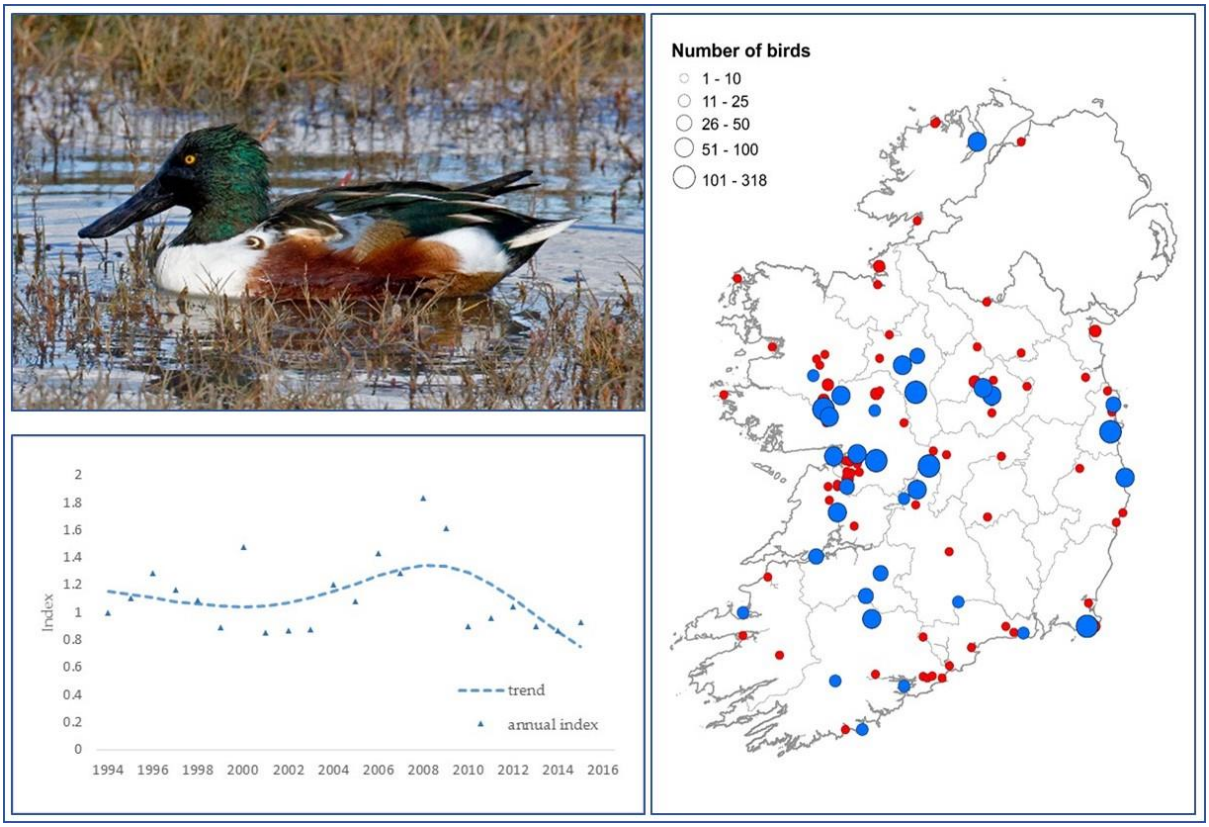


Figure 19 Distribution map and graphed population trend for Shoveler. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Shay Connolly).

Wetlands International (2018) recognises three populations of Northern Shoveler (hereafter Shoveler). The population that breeds across north, north-west and central Europe, and winters in north-west and central Europe occurs in Ireland and has an increasing trend at flyway level.

Numbers in Ireland declined up until 2002/03, and then increased to beyond former levels up to around 2008/2009. Since then however, numbers have declined. Recent research by Pavón-Jordán *et al*. (2018), which included I-WeBS data, provided evidence for a north-eastwards shift of the centre of the wintering population of species preferring shallow waters such as Shoveler, during the 1990s and

early 2000s, but a shift south-westwards thereafter, in response to large-scale changes in winter weather conditions (linked to NAO index values). While this may help explain the trend in wintering Shoveler numbers in Ireland up to 2008/09, the reasons for the declines since then remain a mystery. The overall trend in Northern Ireland has been declining since the early 1990s, while in Britain as a whole, the trend is for increasing numbers (Frost *et al*., 2018).

Shoveler occur on a variety of inland and coastal habitats in Ireland, and they were recorded at 106 sites during the current period. No site currently supports numbers of international importance. Some 33 sites were identified as supporting numbers of national importance with Lough Rea, the Southern Roscommon Lakes (principally Lough Funshinagh and Lough Croan) and the Little Brosna Callows ranked the most important sites, consistent with the former period although mean numbers have declined. Numbers at Tacumshin Lake, Rostaff Lake and Dublin Bay appear stable. The mean numbers at Rahasane Turlough have increased slightly, while the mean number at Doolough Headford (Turloughcor) have more than doubled since the former period.

Table 20 Table showing sites supporting nationally important numbers ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Lough Rea [3]	744	555	276	322	294	369	328	318	369	Dec
Little Brosna Callows [3]			306	531	34	220	46*	273	531	Feb
Southern Roscommon Lakes [3]	154	114	221	172	182	323	296	239	323	Jan
Tacumshin Lake	93	113	72	110	159	175	99	123	175	Dec, Mar
Rostaff Lake	82	20	110	42	190	44	140	105	190	Dec, Jan
Dublin Bay	249	73	101	79	126	97	115	104	126	Nov, Dec
Rahasane Turlough	216	150	200	160	10	122	8	100	200	Nov
Doolough Headford (Turloughcor)	101	66	85	193	86	50	35	90	193	Jan
Pat Reddan's Lake	44	35	82	58	95	57	147	88	147	Jan
Lough Swilly	37	115	100	57	70	120	79	85	120	Nov
North Central Galway Lakes	17*	40	30	52	150		100	83	150	Jan
Kilcolman Marsh	190	42	34	113	83	29	155	83	155	Jan
Lough Owel	300	366	120	106	177	2		81	177	Nov
Inner Galway Bay	253	44	81	159	101	23	23	77	159	Jan
Ballyallia Lake	190	32	64	88	76	98	16	68	98	Dec, Feb
Lough Iron	20	28	58	91	16	62	97	65	97	Jan, Mar
North Wicklow Coastal Marshes	47	55	53	17*	47	79*	83	61	83	
Castleplunket Turloughs	57	21	123	31			104	52	123	

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Charleville Lagoons		50	34	52	50			45	52	Oct, Feb, Mar
Shannon & Fergus Estuary [1]		33	32	51	41	45	55	45	55	Jan
Termon Turloughs	11	25	56	50	39	12	15	34	56	Jan
Annaghmore Lakes	68	2	9	61	59		24	31	61	Jan, Feb
Lough Gur		12	22	24		40		29	40	
Rogerstown Estuary	36	21	26	34	42	15	25	28	42	Dec, Jan
Courtmacsherry Bay, Broadstrand Bay & Dunworley[1]	1	20	21	21	12	31	42	25	42	Feb
Inishcarra Reservoirs	212	1	6	59	20	2*	5	23	59	Dec
Lough Derg (Shannon) [1]		7	89					22	89	Jan
Tralee Bay, Lough Gill & Akeragh Lough [1]	111	2	70	34	2		2	22	70	Dec
Marlfield Lake	16	13	19	25				22	25	
Cork Harbour	25*	17*	33	19	24	23	9	22	33	Jan, Feb
Lough Carra		18	21					21	21	
North East Galway Lakes [1]	75	48	24	27	6		24	20	27	Jan
Tramore Backstrand [1]		5	1	8	21	48		20	48	
Sites no longer supporting numbers of national importance										
Coole Lough - Newtown Turlough	197*	12	45	8	1	10		13	45	
Glen Lough	28		8	7	26	21*	6	12	26	
Corofin Wetlands	40	24		18	18		16	10	18	
Cabragh Wetlands	30	12	7	7	12	7	14	9	14	
Castlelough	20	25			3	4		4	4	

Sites that supported numbers of national importance during the former period, but no data were available for the current period: Cordara Turlough, Dublin Zoo Ponds, Greaghans.

* Low-quality count not included in the calculation of the mean.

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[3]Site demoted (from supporting numbers of international importance to numbers of national importance) since the 2001/02 to 2008/09 period.

4.20 Pochard *Aythya ferina* Póiseard cíordhearg

Russia, N.E. & N.W. Europe (br)

International threshold:	2,000	**Population change (%):**	
All-Ireland threshold:	110	5 year:	-67.5
Population size (2011-2016):		12 year:	-90.6
All-Ireland:	11,150	22 year:	-86.3
ROI:	4,729	Historical:	-
Associated with SPA network:	4,100	Average annual change:	-9.1

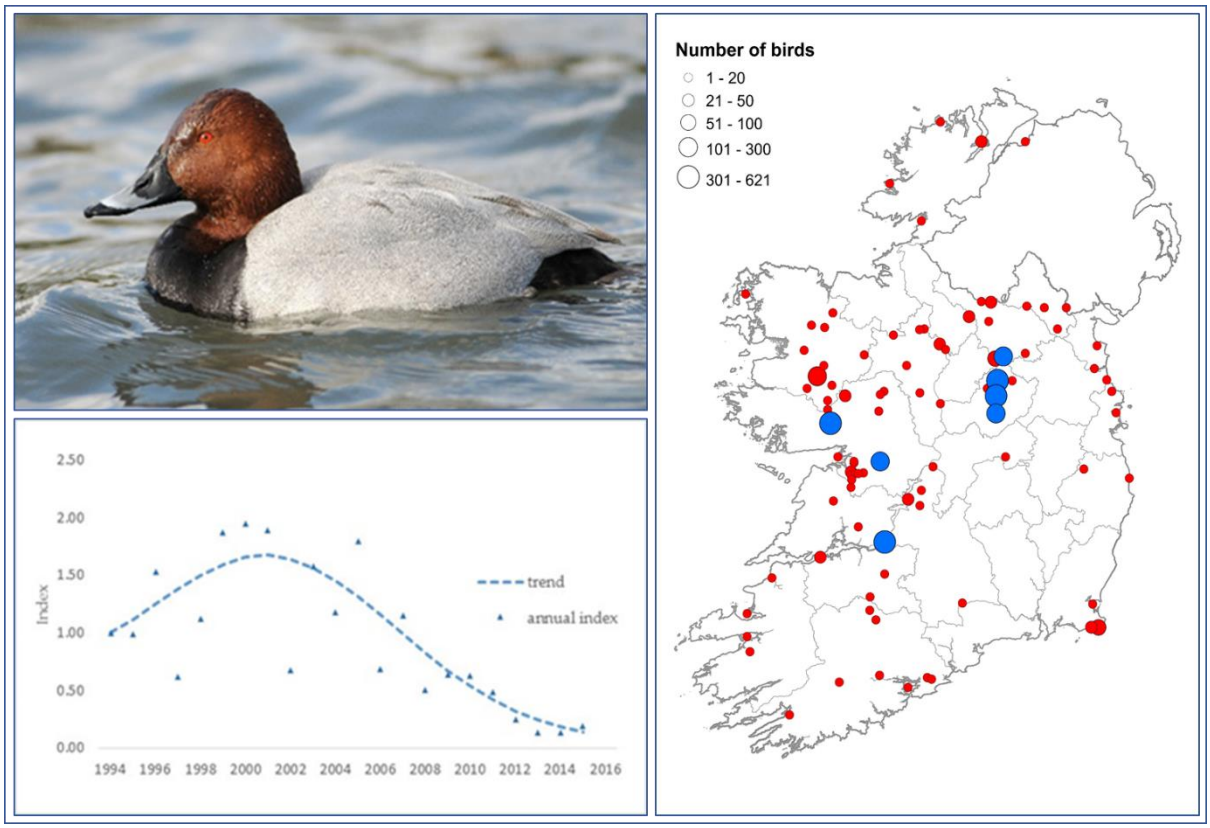


Figure 21 Distribution map and graphed population trend for Pochard. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Michael Finn).

Wetlands International (2018) recognises three populations of (Common) Pochard, all of which are in decline. The population that breeds across Russia and north-west and north-east Europe, and winters in north-east and north-west Europe occurs in Ireland.

Numbers of Pochard wintering in Ireland have fluctuated widely throughout I-WeBS, but there has been a substantial decline since the early 2000s. This downwards trend is consistent with Britain and Northern Ireland (Frost *et al.*, 2018).

As with Goldeneye and Tufted Duck, Loughs Neagh and Beg support the largest numbers of Pochard in the UK and on the island of Ireland, but a decline in their numbers has been evident for some time (e.g. Maclean *et al*., 2006). Site-related issues are thought to be at least partially responsible. Previous research suggested that high levels of nutrient input caused hyper-trophic conditions, with detrimental effects on the chironomid larvae that constitute a major dietary component of Pochard and other diving duck species (Maclean *et al*., 2006). However, more recent research suggested that climate-driven shifts in the wintering distributions were responsible for these declines (e.g. Tománková *et al*., 2013) while a recent paper by Pavón-Jordán *et al*. (2018), provides evidence of long-term north-eastwards shifts in the wintering distributional abundance of species preferring deep water such as Pochard.

Pochard were recorded at 94 sites during the current period. The 1% threshold for national importance has been reduced substantially from 380 during the former period, to the current 110, although this has resulted in very few new sites of significance for Pochard. Seven sites supporting numbers of national importance were identified for the period 2011/12 – 2015/16. Lough Corrib remains the most important site but numbers have declined substantially and this site no longer supports numbers of international importance. Substantial declines in numbers are also evident at the other sites, Lough Sheelin being particularly notable.

Table 20 Table showing sites supporting nationally important numbers of Pochard ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Lough Corrib [3]	3,162	15,450	233*	420	801	1,261		621	1,261	Nov
River Shannon (Lower) [1,4]	467	172	125	758				442	758	Nov
Lough Derravaragh	784	962	504	427	650	171	332	417	650	Feb
Lough Owel	600	557	500	565	780	116	17	396	780	Feb
Lough Ennell	476	619	600	252	55	17	367	258	600	Feb
Lough Sheelin	725	600	365	130	13	19	674	240	674	Jan
Lough Rea [1]	25	13	64	84	85	468	140	168	468	Jan

Sites that supported numbers of national importance during the former period but no data were available for the current period: Lough Kinale & Derragh Lough.

* Low-quality count not included in the calculation of the mean.

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[3]Site demoted (from supporting numbers of international importance to numbers of national importance) since the 2001/02 to 2008/09 period.

[4]Aerial census data.

4.21 Tufted Duck *Aythya fuligula* Lacha bhadánach

N. & N.W. Europe (br)

International threshold:	8,900	**Population change (%):**	
All-Ireland threshold:	270	5 year:	-45.8
Population size (2011-2016):		12 year:	-47.0
All-Ireland:	27,470	22 year:	-28.0
ROI:	16,927	Historical:	-
Associated with SPA network:	11,852	Average annual change:	+0.1

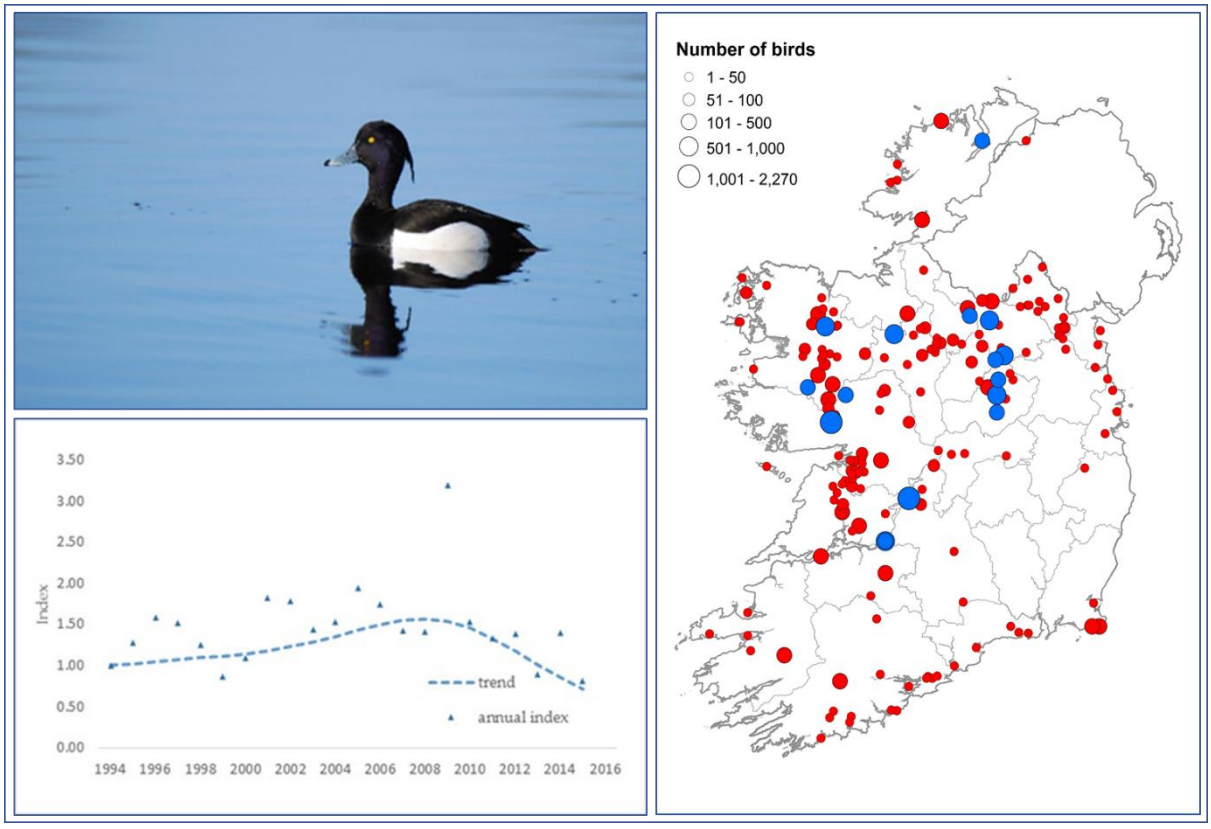


Figure 22 Distribution map and graphed population trend for Tufted Duck. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Brian Burke).

The population of Tufted Duck that breeds and winters throughout north-west Europe is one of three populations recognised by Wetlands International and all are in decline (Wetlands International, 2018).

Numbers of Tufted Duck in Ireland showed an increasing trend through I-WeBS until around 2010, but a decline in numbers since then and the current low index values have led to both long- and short-term population declines being reported. There has been a severe decline in Northern Ireland since the

mid-1990s, but this contrasts to an increasing trend in the UK as a whole. Loughs Neagh and Beg support the largest numbers of Tufted Duck in the UK and on the island of Ireland, but a decline in the numbers has been evident for some time (e.g. Maclean *et al*., 2006). As with Pochard above, wintering population declines at these sites, as well as at the wider scale have been attributed to a shift in the wintering distributions in a north-eastward direction as a response to changes in temperature, with the birds remaining closer to their breeding grounds and fewer migrating to Ireland (migratory short-stopping) (Lehikoinen *et al*., 2013; Pavón-Jordán *et al*., 2018).

Tufted Duck are widely distributed, especially on western and midland wetland complexes and they were recorded at 194 sites during the current period. Seventeen sites were identified to support numbers of national importance which includes five sites that were not of significance during the former period. Lough Corrib remains the most important site in the Republic of Ireland although numbers have declined, a similar trend apparent also for Lough Derg (Shannon). Lough Sheelin was highly ranked during the former period but numbers there have declined substantially with the current mean number less than half of that during the former period. Five sites no longer support numbers of national importance however, but as count coverage at Lough Ree has been poor during the current period, the true status of this site is unknown.

Table 21 Table showing sites supporting nationally important numbers of Tufted Duck ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Lough Corrib	15,482	1,854	1,595*	1,246	1,235	6,558	42	2,270	6,558	Jan
Lough Derg (Shannon)		1,976	1,785		1,196	932	339	1,063	1,785	Nov, Dec
Lough Derg (Shannon) [4]	1,732	3,367	962	1,039				1,001	1,039	
Lough Cullin	1,060	363	1,240	812	600	1,200	270	824	1,240	Nov, Jan
River Shannon (Lower)		212	539	457	538	1,017	925	695	1,017	Nov, Dec
Lough Owel	600	700	1044	807	810	696	97	691	1,044	Nov
Lough Oughter Complex		94*	682	715*	655	147*		669	682	
Lough Gara [1]	330	1678	442*	364	415	950	24*	576	950	Nov
Lough Sheelin	946	1272	623	730	465	455	440	543	730	Jan
River Shannon (Lower) [4]	680	812	375	611				493	611	
Lough Kinale & Derragh Lough	323*				667	258	529	485	667	Mar
Lough Derravaragh [1]	339	473	266	479	767	633	150	459	767	Dec
Lough Ennell [1]	416	680	511	650	387	511	188	449	650	Jan
Lough Swilly	777	713	634	343	226	423	479	421	634	Sep, Nov
Lough Mask [1]	372	509		270*	291	391		341	391	
North Central Galway Lakes [1]	48*	21	220	232	164		570	297	570	Jan
Ballinamore Lakes[1]			513		74			294	513	
Sites no longer supporting numbers of national importance										
Lough Arrow			345	188	234	209		244	345	
River Erne & lakes north of Belturbet	146*	319*	242	186	225			218	242	

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Inishcarra Reservoirs	448	174	50	509	35		47	160	509	
Dublin Zoo Ponds	79					350*			350*	
Lough Ree		760					192*		192*	

* Low-quality count not included in the calculation of the mean.

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[4]Aerial census data.

4.22 Scaup *Aythya marila* Lacha iascán

marila, N. Europe (br)

International threshold:	3,100	**Population change (%):**	
All-Ireland threshold:	25	5 year:	-81.9
Population size (2011-2016):		12 year:	-89.5
All-Ireland:	2,650	22 year:	-98.1
ROI:	167	Historical:	-
Associated with SPA network:	163	Average annual change:	-13.2

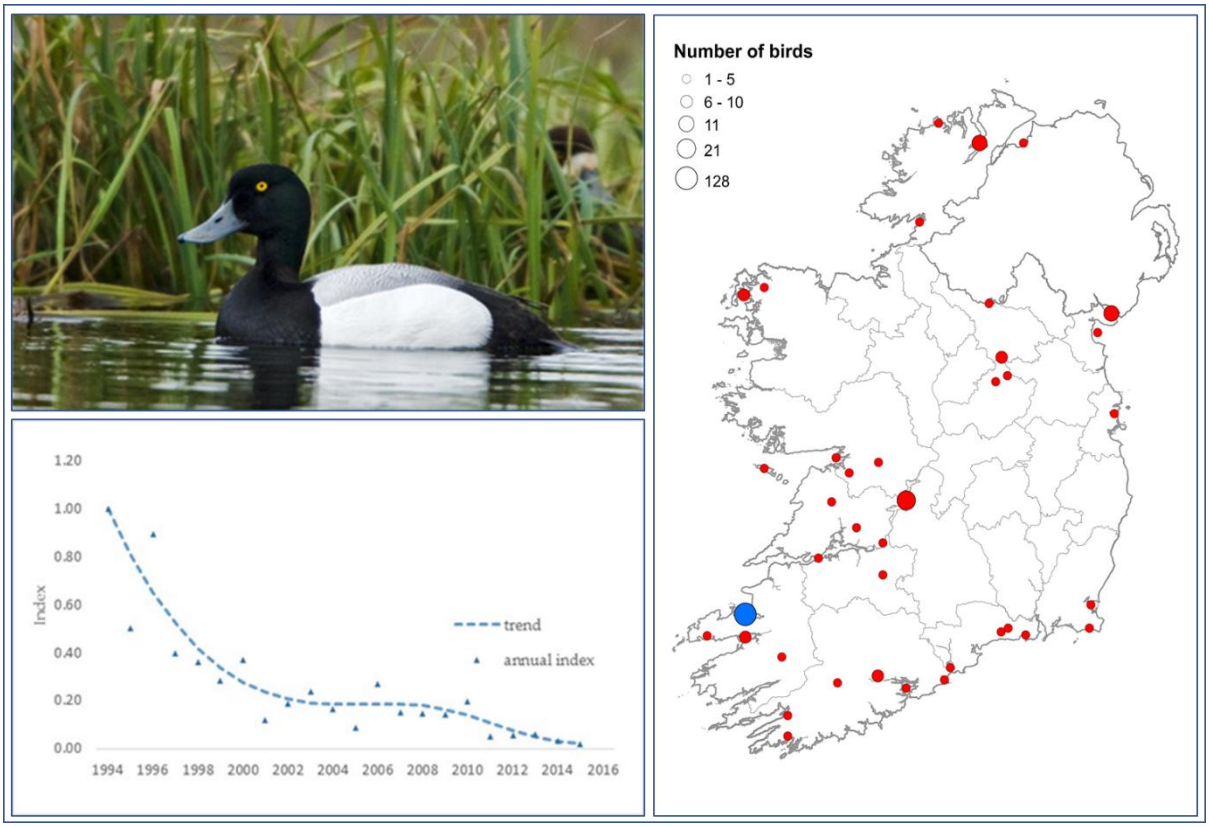


Figure 23 Distribution map and graphed population trend for Scaup. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Ken Kinsella).

The population of Greater Scaup (hereafter Scaup) that breeds across northern Europe and western Siberia winters across western Europe. This population is declining (Wetlands International, 2018). A relatively large and continuous decline in wintering numbers has also been evident throughout I-WeBS. Numbers in Britain are stable over the long-term, but a -53% decline is evident over the past ten years (Frost *et al.*, 2018).

The reasons for the population decline are not well understood. However, the main threats to wintering Scaup in the EU are reported to be (1) degradation of wintering habitat, (2) drowning in

fishing nets, (3) oxygen deficiencies in wintering areas, (4) pollution – especially oil spills and (5) disturbance in wintering and breeding areas (EU Commission, 2009).

Scaup breed on freshwater wetlands but spend winter mainly at coastal sites. They prefer shallow waters, usually less than 10 m deep, leading to a preference for estuaries and shallow bays. Scaup were recorded at 43 sites during the current period. Tralee Bay, Lough Gill and Akeragh Lough was the top ranked site in both the current and former period, although a decline in numbers is evident. Notably, two sites are no longer of significance and these have both sustained declines in numbers, while the status of the species at Brandon Bay in County Kerry is not known for the current period.

Table 22 Table showing sites supporting nationally important numbers of Scaup ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Tralee Bay, Lough Gill & Akeragh Lough	257	581	178	95	210	124	35	128	210	Oct
Sites no longer supporting numbers of national importance										
Lough Swilly	31	2	8	18	17	3	7	11	18	
Carlingford Lough †	62	57	12	22	4	4		11	22	

Sites that supported numbers of national importance during the former period but no data were available for the current period: Brandon Bay - Inner Brandon Bay.

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[4]Aerial census data.

4.23 Eider *Somateria mollissima* Éadar

mollissima, Baltic, Denmark & the Netherlands (br)[1]

mollissima, Norway & Russia (br)[2]

Population origin(s) of wintering birds uncertain and may possibly originate from some combination of up to three populations.

International threshold:	9,800[1]/ 5,200[2]
All-Ireland threshold:	55
Population size (2011-2016):	
All-Ireland:	5,660
ROI:	1,373
Associated with SPA network:	130

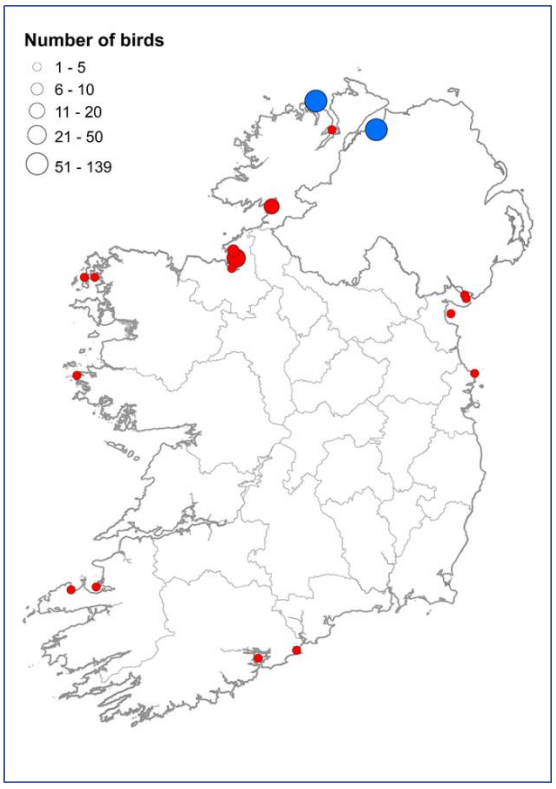


Figure 24 Distribution map for Eider. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). (Photo: Dick Coombes).

Wetlands International (2018) describe three breeding populations of (Common) Eider and the wintering range of these populations is largely unknown. The status of these populations is mixed. The nominate *mollissima* (Baltic, Denmark & Netherlands) is stable/fluctuating, the populations from Norway/NW Russia is stable/increasing while *Somateria mollissima borealis* breeding in Svalbard and Franz Joseph (Russia and Norway) is possibly declining.

Within the Republic of Ireland, Eider have increased in wintering numbers over time with Burke *et al*. (2018b) reporting short- and long-term changes in estimates of +76% and +101% respectively since the previous assessment period of 2006/07-2010/11 (Crowe & Holt, 2013) and 1994/95-1998/99 (Crowe *et al*., 2008). The increase in numbers is consistent with Northern Ireland. However, population estimates for Eider must be treated with some caution as flocks may sometimes be located too far offshore for accurate counts to be made from land-based vantage points, while weather and count conditions can hamper the attainment of accurate counts. Across the UK as a whole, the species is exhibing a decline over the long-term (Frost *et al*., 2018).

Eider were recorded at 18 sites during the current period (2011/12-2015/16) and, with a mostly northerly distribution, occurred predominantly in Counties Sligo, Mayo and Donegal, although records were also obtained for Cork, Dublin, Galway, Kerry and Louth.

The cross-border site, Lough Foyle (NI) continues to support numbers of national importance and be the most important site for this species.

Table 23 Table showing sites supporting nationally important numbers of Eider ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Lough Foyle †	452	206	13	75	181	45	380	139	380	
Fanad North Coast [1]				118				118	118	

Sites that supported numbers of national importance during the former period but no data were available for the current period: Inishtrahull Island.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

4.24 Long-tailed Duck *Clangula hyemalis* Lacha earrfhada

W. Siberia & N. Europe (br)[1]

Iceland & Greenland (br)[2]

International threshold: 16,000[1]/ 600[2]

All-Ireland threshold: -

Mean/ Peak (2011/12 – 2015/16): 71/111

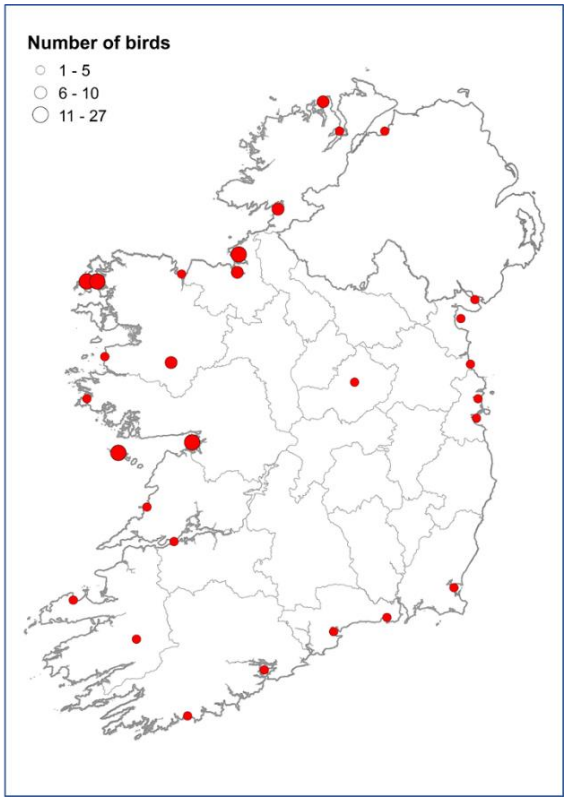


Figure 25 Distribution map for Long-tailed Duck showing peak numbers recorded at sites between 2011/12 and 2015/16 (Photo: Dick Coombes).

There are two populations of Long-tailed Duck (Wetlands International, 2018). Both populations can occur in the north Atlantic in Irish waters in winter, i.e. those from Iceland/ Greenland and west Siberian/northern Europe; these populations are stable and decreasing, respectively (Wetlands International, 2018). These seaducks often occur some distance from the shoreline, and hence may be undetected or underestimated from ground-based surveys such as I-WeBS. The absence of detailed aerial or boat-based surveys of key locations used by this species makes it difficult to generate accurate population size and trend information in Britain and Ireland.

Long-tailed Duck were recorded at 29 sites in the Republic of Ireland during the current period with no site regularly supporting in excess of 20 birds.

Table 24 Table showing sites that supported Long-tailed Duck in five or more seasons between 2009/10 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Mullet West[3]	17	14	14	27	17	19		19	27	Nov
Drumcliff Bay Estuary	6	6	8	23	7	10	14	12	23	Nov
Inishmore, Aran Islands	1	17	7	17		13	17	11	17	Jan
Blacksod & Tullaghan Bays	2		1	1	5	3	20	6	20	
Inner Galway Bay	5	3	10	12	4		1	5	12	Mar
Donegal Bay	10	16	2	3	7	2	10	5	10	

[3]Site demoted (from supporting numbers of national importance during the 2001/02 to 2008/09 period).

Other sites recorded in less than five seasons (peak count 2011/12 – 2015/16):

Ballysadare Bay (9), Brandon Bay - Inner Brandon Bay (1), Broadmeadow (Malahide) Estuary (3), Carlingford Lough (NI) (5), Cork Harbour (1), Dublin Bay (2), Dundalk Bay (3), Dungarvan Harbour (3), Fanad North Coast (6), Killala Bay (3), Lough Carra (6), Lough Foyle NI (2), Lough Leane & Killarney Valley (1), Lough Owel (1), Lough Swilly (2), Mannin Bay (1), Mid-Clare Coast (Mal Bay - Doonbeg Bay) (1), Nanny Estuary & shore (1), Rosscarbery (1), Shannon & Fergus Estuary (2), South Mayo Coast (2), Tramore Back Strand (1), Wexford Harbour & Slobs (4).

4.25 Common Scoter *Melanitta nigra* Scótar

nigra, W. Siberia, Scandinavia, Iceland, Scotland, Ireland (br)

International threshold:	7,500
All-Ireland threshold:	110
Population size (2011-2016):	
All-Ireland:	10,640
ROI:	10,607
Associated with SPA network:	6,182

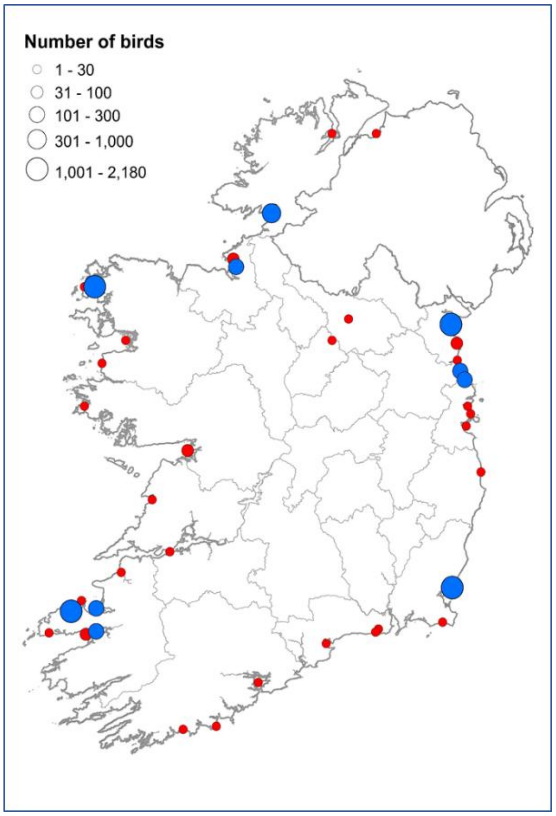


Figure 26 Distribution map for Common Scoter. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles) (Photo: Oran O'Sullivan).

Common Scoter that winter in Ireland come from a wide breeding range that spans between Iceland and Scandinavia east to western Siberia. The status of this population is uncertain but is considered stable/increasing (Wetlands International, 2018). Given that this sea duck can occur at considerable distances offshore, they are often undetected or underestimated during I-WeBS counts and hence no trend information is provided, furthermore, as a result, the population estimate should be treated with caution. A small breeding population remains in Counties Galway, Mayo and Sligo (Balmer *et al.*, 2013).

Common Scoter were recorded at 40 coastal sites during the current period, with ten sites identified as supporting numbers of national importance. Numbers have declined at the former top ranked site, Wexford Bay, while numbers at Blacksod & Tullaghan Bays, Brandon Bay - Inner Brandon Bay and Dundalk Bay have increased, which can be at least partially attributed to better count coverage in recent seasons. Dunany Point - Clogher Head is notable for no longer qualifying for listing as a significant site with much reduced numbers.

Table 25 Table showing sites supporting nationally important numbers of Common Scoter ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Blacksod & Tullaghan Bays	621	9*	1,076	1,210	3,632	2,100	2,882	2,180	3632	Feb
Brandon Bay - Inner Brandon Bay			2,275	1,760	400			1,478	2275	Feb
Dundalk Bay	467	775	1,137	1,443	220	2,000	2,089	1,378	2089	Jan
Wexford Bay	8,261	400	1,080	736	1,704	1,269		1,197	1704	
Donegal Bay	2,327	1,791	1,855	135	457	140	1,132	744	1855	Feb
Nanny Estuary & Shore	437	41	94*	99*	312		150	231	312	Dec, Feb
Castlemaine Harbour & Rossbehy	560*	448	300	685		14	50	210	685	
Delvin River - Hampton Cove				349	220	152	62	196	349	
Sligo Harbour [1]				830				166	830	Jan, Feb
Tralee Bay, Lough Gill & Akeragh Lough [1]	38	63	326	200		25		110	326	Mar
Sites no longer supporting numbers of national importance										
Dunany Point - Clogher Head	198	41	12	148			50	53	148	
Broadmeadow (Malahide) Estuary	278			30				6	30	

* Low-quality count not included in the calculation of the mean.

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

4.26 Goldeneye *Bucephala clangula* Órshúileach

clangula, N. & N.W.Europe (br)

International threshold:	11,400	**Population change (%):**	
All-Ireland threshold:	40	5 year:	-37.1
Population size (2011-2016):		12 year:	-50.3
All-Ireland:	3,820	22 year:	-63.8
ROI:	1,256	Historical:	-60.9
Associated with SPA network:	793	Average annual change:	-4.3

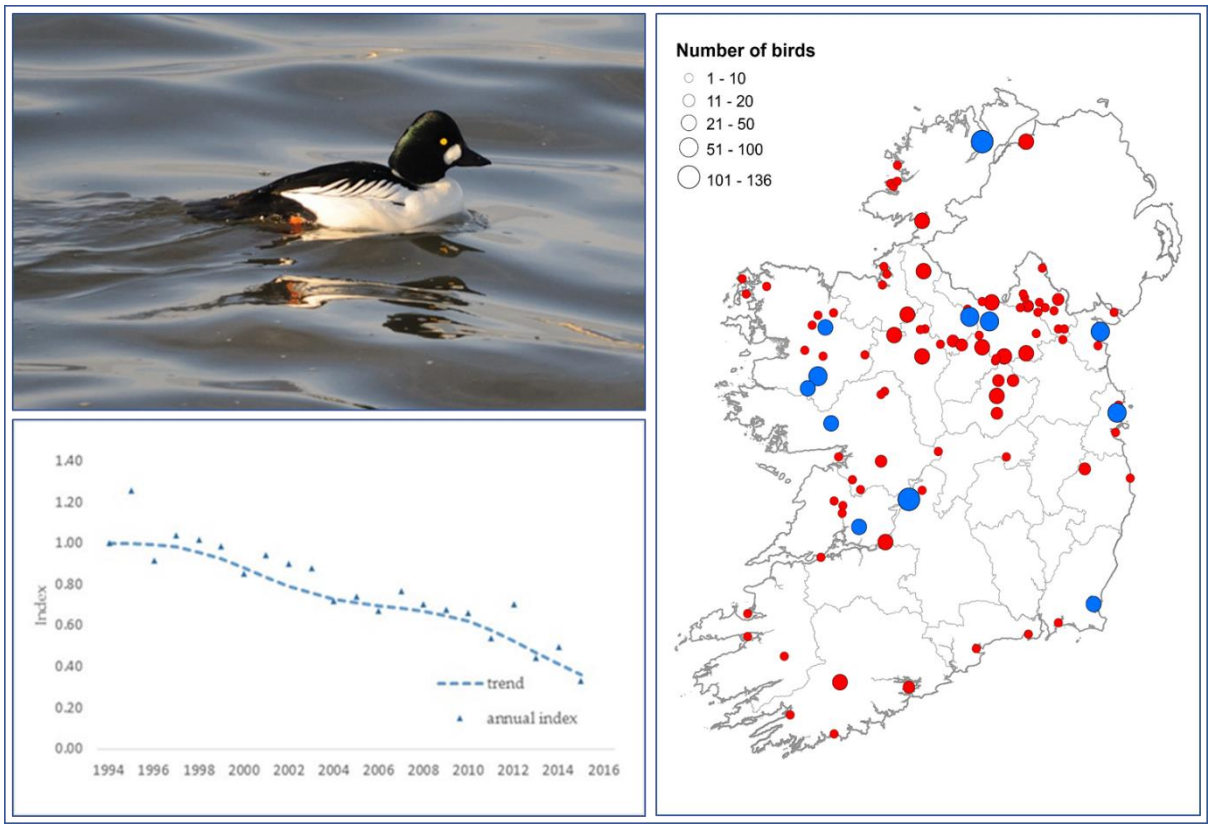


Figure 27 Distribution map and graphed population trend for Goldeneye. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the smoothed trend (hatched line) (Photo: John Fox).

The flyway population of (Common) Goldeneye which breeds across north and north-west Europe and winters in north-west and central Europe is one of four populations of this species. The population trend is unclear (stable/decline) (Wetlands International, 2018). The indices for the Republic of Ireland have shown a declining trend since I-WeBS began, while the UK has observed an equally sustained decline in wintering numbers (-58% over 25 years) (Frost *et al.*, 2018).

Loughs Neagh and Beg support the largest numbers in the UK and hold the vast majority of the all-Ireland wintering population, although a decline in the number of Goldeneye at this site has been evident for some time (e.g. Maclean *et al*., 2006).

Wintering population declines have been attributed to a shift in the wintering distributions in a north-eastward direction as a response to changes in temperature, with the birds remaining closer to their breeding grounds with fewer migrating to Ireland (migratory short-stopping) (Lehikoinen *et al*., 2013).

Goldeneye were distributed at 105 coastal and inland sites during the current period. Twelve sites supported numbers of national importance; an increase on the seven sites identified during the former period and a result of the 1% national threshold being reduced from 95 to 40 birds.

Lough Derg (Shannon) (aerial) supported the largest mean numbers, while Lough Sheelin, the top ranked site during the former period no longer qualified for this listing. Numbers at Lough Swilly were relatively stable while those at Lough Carra, Braodmeadow (Malahide) Estuary and Lough Oughter Complex have declined.

Table 26 Table showing sites supporting nationally important numbers of Goldeneye ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Lough Derg (Shannon) [4]	443	145	134	137				136	137	
Lough Swilly	147	171	174	150	94	131	63	122	174	Feb
Lough Carra	102	129	94					94	94	
Broadmeadow (Malahide) Estuary	126	93	51	66	36	92	31	55	92	Dec
Lough Oughter Complex		13*	56	66	43	14*		55	66	
Dundalk Bay [1,4]	32	6	34	100	50	31	51	53	100	Mar
Ballinamore Lakes [1]			66		40			53	66	
Lough Cullin [1]	41	74	41	48	45	51	52	47	52	Nov, Jan
Wexford Harbour & Slobs [1]	49*	37*	53	11	63	53	57	47	63	Nov, Jan
South East Clare Lakes [1]	11*	55	68	54	50	38	26	47	68	Feb
Lough Corrib[1]	59	62	52*	90	48	36		44	90	Jan
Lough Mask [1]	73	47		4*	21	61		41	61	
Sites no longer supporting numbers of national importance										
Lough Sheelin	6	32	23	21	25	38	24	26	38	
River Shannon (Lower)[4]	171	21	35	31				33	35	

* Low-quality count not included in the calculation of the mean.
[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.
[4]Aerial census data.

4.27 Smew *Mergellus albellus* Síolta gheal

N. Scandinavia, N. Russia (br)

Scarce winter visitor

International threshold: 300

Mean/ Peak (2011/12 – 2015/16): 3/4

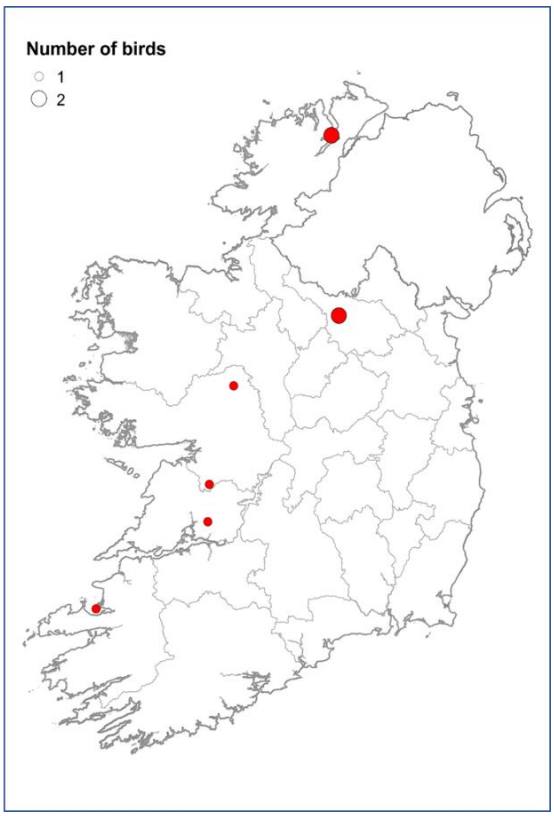


Figure 28 Distribution map for Smew showing peak numbers recorded at sites between 2011/12 and 2015/16 (Photo: Mark Carmody).

Smew are a scarce winter visitor to Ireland from the population that breeds across northern Scandinavia and Russia and winters in north-west and central Europe. The status of this population is unclear (stable?) (Wetlands International, 2018).

This species was recorded at six sites during the current period including regular occurrence at Lough Swilly where a peak count of three birds was recorded during 2010/11.

Table 27 Table showing sites that supported Smew in five or more seasons between 2009/10 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Lough Swilly	2	3	2	2	1	1	1	1	2	Jan

Other sites recorded in less than five seasons (peak count): Glenamaddy Turlough (1), Lough Cutra - Ballynakill L. (1), Lough Oughter Complex (2), South East Clare Lakes (1), Tralee Bay, Lough Gill & Akeragh Lough (1).

4.28 Red-breasted Merganser *Mergus serrator* Síolta rua

N, N.W. Europe, Iceland & Greenland (br)

International threshold:	860	**Population change (%):**	
All-Ireland threshold:	25	5 year:	-18.4
Population size (2011-2016):		12 year:	-8.1
All-Ireland:	2,430	22 year:	-28.1
ROI:	1,913	Historical:	+5.2
Associated with SPA network:	966	Average annual change:	-0.9

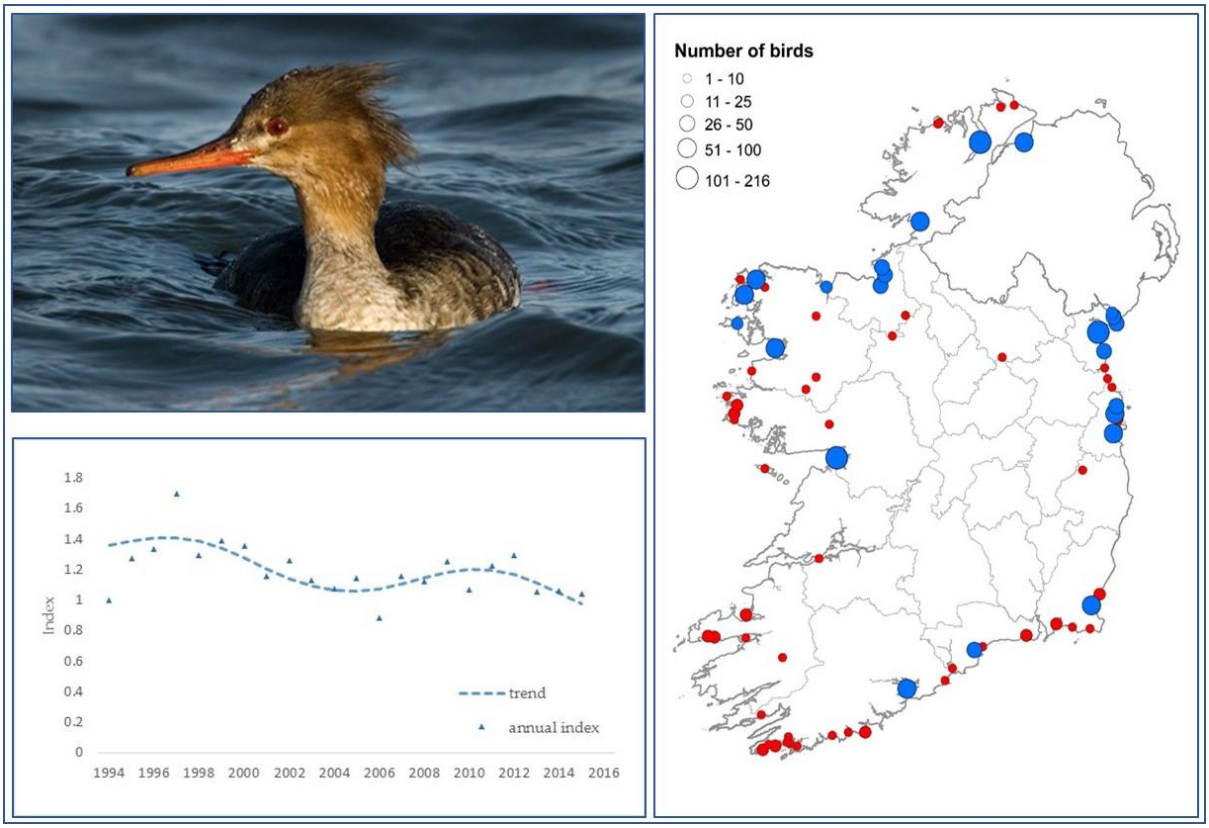


Figure 29 Distribution map and graphed population trend for Red-breasted Merganser. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the smoothed trend (hatched line) (Photo: Clive Timmons).

Wetlands International (2018) recognises three populations of Red-breasted Merganser. The population that breeds across north and north-west Europe, Iceland and east Greenland, and winters across north, north-west and central Europe and Iceland occurs within Ireland. The status of this population is unclear (stable/decline) (Wetlands International, 2018).

The trend of the wintering population in the Republic of Ireland is for decline over both the long- and short-term periods; consistent with the UK. Wintering population declines have been attributed to a shift in the wintering distributions in a north-eastward direction as a response to changes in

temperature, with the birds remaining closer to their breeding grounds and fewer migrating to Ireland (migratory short-stopping) (Pavón-Jordán *et al*., 2018).

Red-breasted Merganser are widely distributed around coastal sites, and they were recorded at 73 sites during the current period. This is a decrease on the 89 sites reported during the former period.

A reduction in the 1% national threshold from 35 to 20 has likely resulted in an increase in the number of sites supporting numbers of national importance; from 15 during the fomer period, to 23 sites during the current period. Dundalk Bay and Inner Galway Bay remain the top two ranked sites with numbers apparently stable. Numbers at Carlingford Lough (NI), the third highest ranked site during the former period have declined based on our most recent data, and this also appears to be the case at the other cross-border site Lough Foyle. Numbers at Donegal Bay, Wexford Harbour & Slobs and Clew Bay appear relatively stable.

Table 28 Table showing sites supporting nationally important numbers of Red-breasted Merganser ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Dundalk Bay	60	114	247	181	109	455	90	216	455	Sep, Jan
Inner Galway Bay	207	169	248	223	191	221	117	200	248	Nov
Lough Swilly	136	71	89	154	154	126	167	138	167	Nov, Dec
Wexford Harbour & Slobs	136*	43*	100	78	92	137	95	100	137	Nov
Donegal Bay	65	82	50	156	117	106	70	100	156	Oct
Clew Bay	64	81	103	107	63	112	105	98	112	
Blacksod & Tullaghan Bays	80	43*	109	76	125	87	36	87	125	
Lough Foyle †	101	120	35	73	101	58	98	73	101	Feb
Dublin Bay	58	63	114	50	60	57	69	70	114	Feb
Cork Harbour	63*	61*	71	50	55	86	70	66	86	Jan, Feb
Broadmeadow (Malahide) Estuary	161	78	87	57	80	35	26	57	87	Jan
Broadhaven & Sruwadaccon Bays	80	21	79	67	42	34		56	79	Nov
Dungarvan Harbour [1]	32	31	38	40	46	81	40	49	81	Nov, Dec
Dundalk Bay Outer (North: Ballagan Point – Giles Quay) [1]	45		3	9		16*	177	47	177	Jan
Dunany Point – Clogher Head	65	98	40	42			84	42	84	Mar
Ballysadare Bay	37	23	43	20	35	45	33	35	45	Jan, Feb
Sligo Harbour [1]	23	15	40	30	32	37	23	32	40	Jan
Drumcliff Bay Estuary [1]	19	7	57	13	22	18	30	28	57	Jan
Rogerstown Estuary [1]	30	16	30	22	20	39	23	27	39	Mar
Carlingford Lough †	24	35	37	13	6	44	15	23	44	Dec, Jan
Carlingford Lough (ROI)							76	38	76	
Achill Island [1]	12	11	16	16	28	23	22	21	28	

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Killala Bay [1]	3	10	23	25	19	27	6	20	27	

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

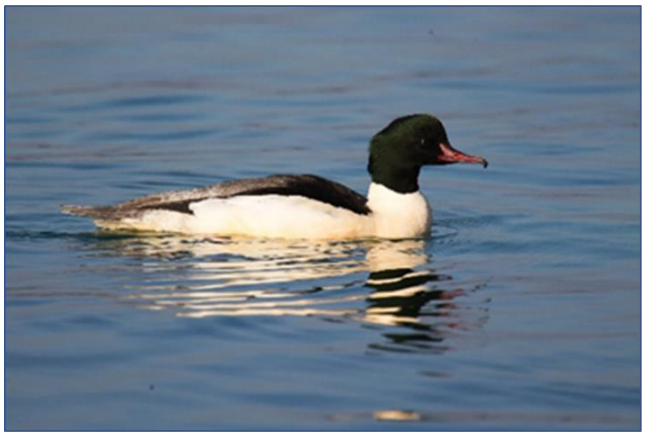
4.29 Goosander *Mergus merganser* Síolta mhór

merganser, Scandinavian Baltic, W. Russia, Britain (br)

Scarce

International threshold: 2,100

Mean/ Peak (2011/12 – 2015/16): 14/24



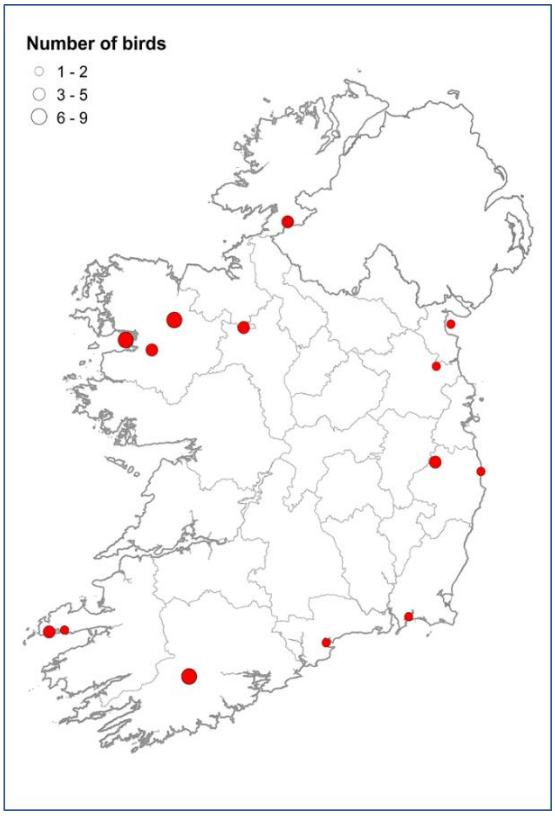


Figure 30 Distribution map for Goosander showing peak numbers recorded at sites between 2011/12 and 2015/16 (Photo: Mark Carmody).

Small numbers of Goosander have bred in Ireland and these birds belong to the population that breeds in Britain, Scandinavia, the Baltic and western Russia. The status of this population is unclear (stable/decline) (Wetlands International, 2018).

Just two confirmed records of breeding were reported in the last Bird Atlas (2007-2011) (Balmer *et al*., 2013). It is possible that birds recorded in Ireland during the winter are Irish breeding birds. Nesting Goosander are secretive and can easily be missed, so the winter numbers and distribution may be indicative of more widespread nesting (BirdWatch Ireland, 2013). However, numbers during winter are also likely increased by winter visitors from the continent. There is evidence that wintering numbers are increasing (Balmer *et al*., 2013), and I-WeBS data supports this with the mean number of birds increasing from six during the fomer period (Boland & Crowe, 2012) to a mean of 14 for the current period (2011/12 – 2015/16).

Two sites recorded the species with most regularity between 2009/10-2015/16 (see Table 29), with Inishcarra Reservoirs recording a peak count of nine individuals.

Table 29 Table showing sites that supported Goosander in five or more seasons between 2009/10 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Inishcarra Reservoirs	1	5	9	3	5		2	4	9	Jan
Lough Swilly	2	1	1		2	1	1	1	2	Jan

Other sites recorded in less than five seasons (peak count 2011/12 – 2015/16):

An Trá Beg (1), Bannow Bay (1), Cashel Turlough (3), Clew Bay (6), Dundalk Bay (1), Dungarvan Harbour (2), Lough Acapple (3), Lough Cullin (9), Lough Gara (5), Lough Shivnagh (Tully) (1), North Wicklow Coastal Marshes (1), Poulaphouca Reservoir (3), River Boyne (1), Ventry Harbour (4).

4.30 Red-throated Diver *Gavia stellata* Lóma rua

Arctic and boreal west Eurasia, Greenland (br)

International threshold:	3,000
All-Ireland threshold:	20
Population size (2011-2016):	
All-Ireland:	770
ROI:	657
Associated with SPA network:	193

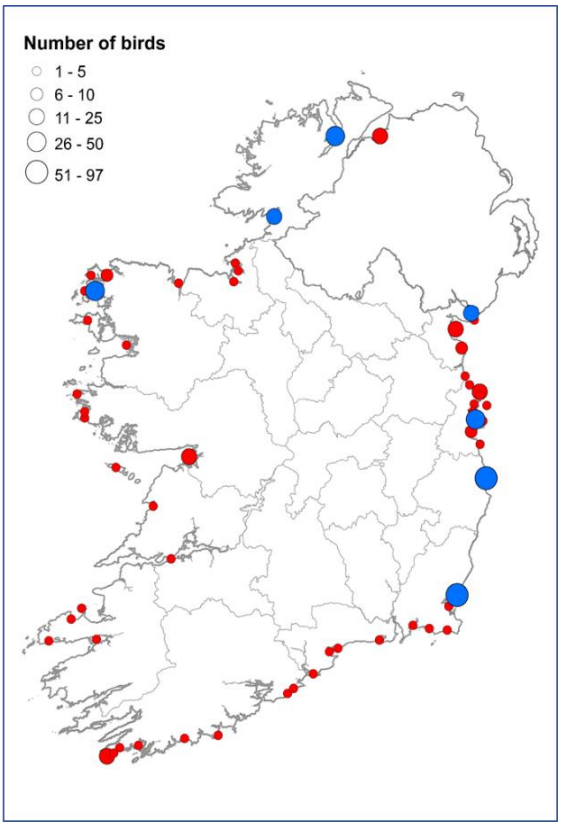


Figure 31 Distribution map for Red-throated Diver illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles) (Photo: John Fox).

The north-west European wintering population of Red-throated Diver breeds across Arctic and boreal west Eurasia and Greenland; the population status is uncertain (stable?) (Wetlands International, 2018).

The species exhibits a widespread coastal distribution during winter and flocks are often located some distance from the shoreline, and are likely frequently undetected or underestimated. Thus no trend information is provided and the population estimate should be treated with caution.

Red-throated Diver were recorded at 61 sites during the current period and seven sites held numbers that exceeded the nominal 1% threshold of 20 birds during the period 2011/12 – 2015/16. The five-year

mean for the top-ranked site (North Wicklow Coastal Marshes) is more than double that recorded for the former period, while numbers at Wexford Bay are highly consistent with the former period. In contrast, numbers have dropped at Lough Foyle (NI), and it is one of six sites that are no longer of significance when compared to the former period.

Table 30 Table showing sites supporting nationally important numbers of Red-throated Diver ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
North Wicklow Coastal Marshes	27	58	115	86*	86	32*	89	97	115	Dec
Wexford Bay	38	4	32		103	111		62	111	Dec, Jan, Feb
Baldoyle Bay [1]	2				14	64		39	64	Nov, Dec
Blacksod & Tullaghan Bays [1]	6	3*	53	23	31	16	64	37	64	
Lough Swilly [1]	6	6	36	20	32	7	34	26	36	Nov
Carlingford Lough (RoI) [1]							46	23	46	
Donegal Bay	10	36	4	38	34	17	12	21	38	Oct
Sites no longer supporting numbers of national importance										
Dundalk Bay	46	8	26	13	14	10	17	16	26	Jan, Mar
Inner Galway Bay	20	17	19	24	4	5	2	11	24	Mar
Lough Foyle †	128	19	7	14	33	22	17	19	33	
Brandon Bay - Inner Brandon Bay			2	13				5	13	Jan, Feb
Clonea Strand	30	32	1	11	2	3		4	11	

Sites that supported numbers of national importance during the former period but no data were available for the current period: Garrarus & Kilfarrassy.

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1] Site not of significant importance during the former period, between 2001/02 and 2008/09.

4.31 Black-throated Diver *Gavia arctica* Lóma Artach

arctica, N. Europe & W. Siberia (br)

Scarce

International threshold: 3,500

Mean/ Peak (2011/12 – 2015/16): 21/45

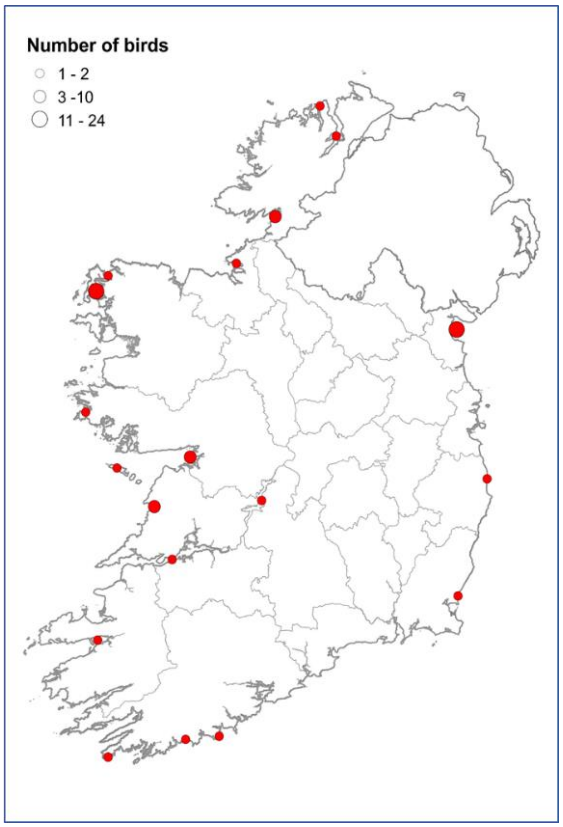


Figure 32 Distribution map for Black-throated Diver showing peak numbers recorded at sites between 2011/12 and 2015/16 (Photo: Dick Coombes).

The population of Black-throated Diver that breeds across northern European and west Siberian has a large wintering range that includes northwest Europe, the Mediterranean, Black and Caspian Seas. The status of this population is uncertain, possibly in decline (Wetlands International, 2018).

This species occurs in small numbers in British and Irish waters. Small numbers were recorded during the current period at 19 sites. Inner Galway Bay, Blacksod and Tullaghan Bays, and Donegal Bay supported the species with most regularity (Table 31).

Table 31 Table showing sites that supported Black-throated Diver in five or more seasons between 2009/10 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Inner Galway Bay	28	41	8	5		8	5	5	8	Jan
Blacksod & Tullaghan Bays	2		1	1	12	1	3	4	12	Feb
Donegal Bay	13	13	3	3	6	4	1	3	6	Jan

Other sites recorded in less than five seasons (peak count): Barley Cove Bay (1), Broadhaven & Sruwadaccon Bays (3), Castlemaine Harbour & Rossbehy (1), Courtmacsherry Bay, Broadstrand Bay & Dunworley (1), Drumcliff Bay Estuary (1), Dundalk Bay (2), Fanad North Coast (1), Inishmore, Aran Islands (1), Liscannor Bay (Liscannor - Rinanoughter) (1), Lough Derg (Shannon) (1), Lough Swilly (3), Mannin Bay (1), North Wicklow Coastal Marshes (1), Rosscarbery (1), Shannon & Fergus Estuary (2), Wexford Bay (1)

4.32 Great Northern Diver *Gavia immer* Lóma mór

N. America, Greenland, Iceland, Bear Island (br)

International threshold:	50
All-Ireland threshold:	20
Population size (2011-2016):	
All-Ireland:	2,240
ROI:	2,128
Associated with SPA network:	518

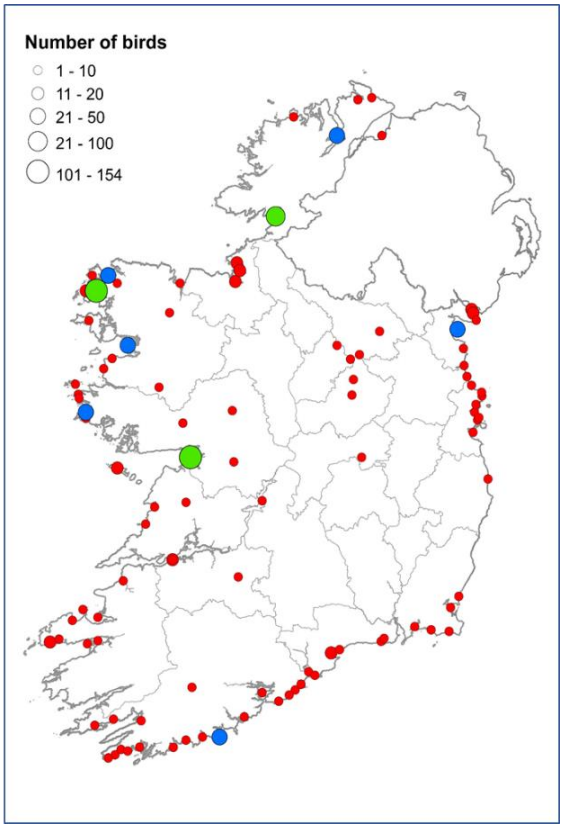


Figure 33 Distribution map for Great Northern Diver. The distribution map illustrates sites supporting numbers of international importance (green circles), national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). (Photo: John Fox).

Great Northern Diver that breed in North America, Greenland, Iceland and Bear Island spend winter in coastal north-west Europe. This population has an uncertain population trend and is possibly in decline (Wetlands International, 2018).

The species exhibits a widespread coastal distribution during winter utilising shallow nearshore waters to a greater degree at certain times (e.g. storms, driving onshore winds). As flocks are often located some distance from the shoreline, and are likely frequently undetected or underestimated, no trend information is provided, and the population estimate should be treated with caution.

Great Northern Diver was recorded at 101 sites during the current period with three sites supporting numbers of international importance, consistent with the former period. A further six sites supported numbers of national importance, based on the nominal threshold of 20 individuals. Numbers at Lough Foyle (NI) have dropped below the threshold and this site is no longer of significance. With the exception of Dundalk Bay and Courtmacsherry Bay, Broadstrand Bay & Dunworley, all sites of significance have a north-west coast distribution.

Table 32 Table showing sites supporting internationally and/or nationally important numbers of Great Northern Diver ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of international importance										
Inner Galway Bay	168	305	146	157	209	86	173	154	209	Jan, Mar
Blacksod & Tullaghan Bays	70	41_	93	196	123	74	34	104	196	Feb
Donegal Bay	110	173	58	94	134	40	39	73	134	Jan
Sites supporting numbers of national importance										
Mannin Bay [1]	34	25		64	22	28	12*	38	64	Oct
Broadhaven & Sruwadaccon Bays [1]	42	31	59	26	19	44		37	59	Feb
Clew Bay [1]	38	18	44	26	36	39	28	35	44	Jan
Courtmacsherry Bay, Broadstrand Bay & Dunworley [1]	29	27	11	29	42	45	17	29	45	Dec
Dundalk Bay	16		35	10	37	15	29	25	37	Jan
Lough Swilly [1]	33	10	24	19	14	20	27	21	27	Feb, Mar
Sites no longer supporting numbers of national importance										
Lough Foyle †	55	9	3	3	7	11	3	5	11	

Sites that supported numbers of international importance during the former period but no data were available for the current period: Keeragh Islands.

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

4.33 Little Grebe *Tachybaptus ruficollis* Spágaire tonn

ruficollis, Europe E. to Urals, N.W. Africa (br)

International threshold:	4,700	**Population change (%):**	
All-Ireland threshold:	20	5 year:	-4.3
Population size (2011-2016):		12 year:	+9.7
All-Ireland:	2,200	22 year:	+44.4
ROI:	1,594	Historical:	-
Associated with SPA network:	944	Average annual change:	+2.4

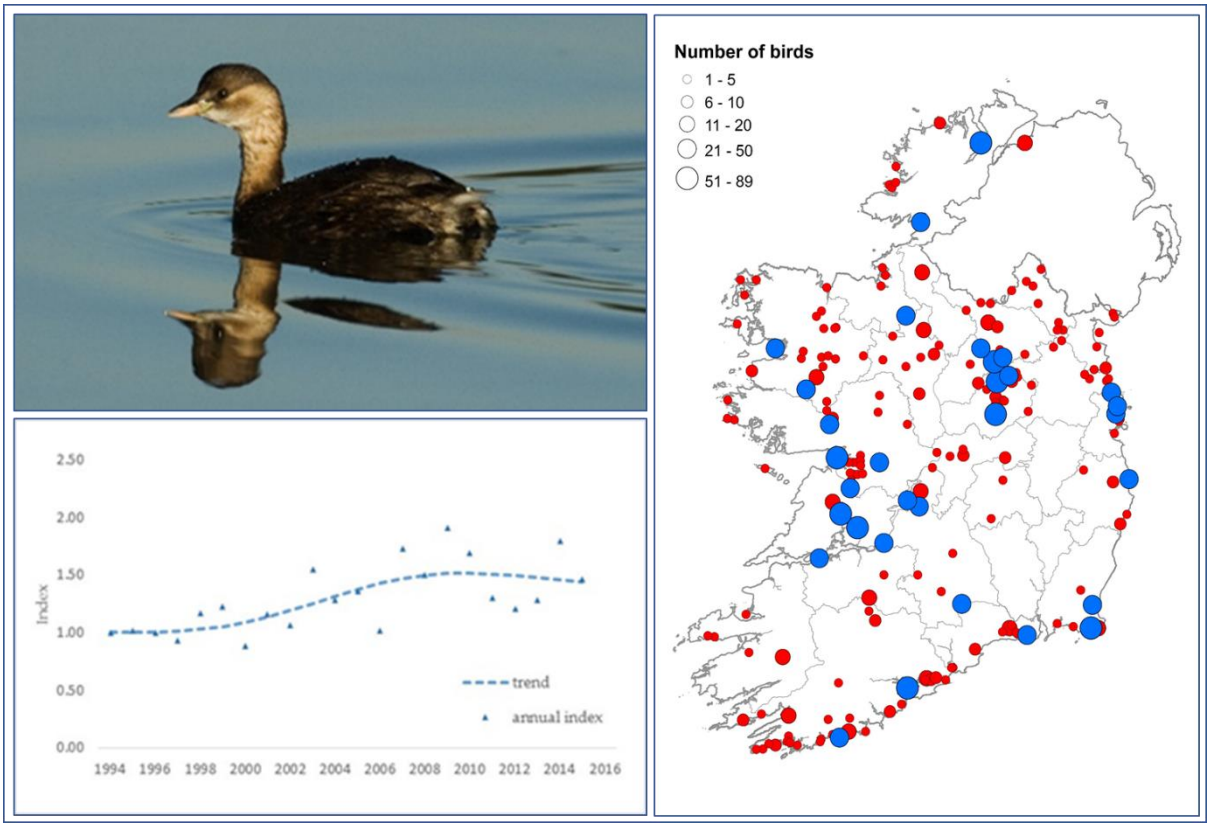


Figure 34 Distribution map and graphed population trend for Little Grebe. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the smoothed trend (hatched line) (Photo: Clive Timmons).

The population of Little Grebe that occurs across Europe and north-west Africa has an uncertain trend (stable/decline) (Wetlands International, 2018). In Ireland, numbers have been increasing across the long-term but a short-term decline (-4% over recent 5-year period) is now evident. This is consistent with Britain where a 2% decline in numbers over the past ten years has been reported (Frost *et al.*, 2018) although stable/increasing over the long-term. Numbers in Northern Ireland however were stable up until the mid-2000s and are now exhibiting a decline.

Little Grebe is widely dispersed on a variety of coastal and inland wetlands and can be quite secretive and hence overlooked during counts, so population estimates and trends for this species should be treated with caution. They were recorded at 212 sites during the current period, including 31 sites which supported numbers of national importance. The increase in sites of significance is partially attributed to the decrease in 1% threshold from 25 to 20 since the former period, with 19 sites now promoted to this listing.

The top three ranked sites during the former period (Lough Derravaragh, Lough Ennell and Lough Ree) have observed declines in numbers, with no site achieving a mean number of more than 100 birds. However, Lough Ree, which appears to no longer support numbers of national importance, has received inconsistent count coverage in recent seasons so may well still be of significance. Numbers at Lough Swilly, Cork Harbour and Inner Galway Bay are highly consistent with the former period.

Table 33 Table showing sites supporting nationally important numbers of Little Grebe ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Lough Swilly	72	59	78	58	110	109	88	89	110	Sep, Nov
Inner Galway Bay	82	71	83	70	114	121	37	85	121	Nov
South East Clare Lakes [1]	54*	76	60	95	72	68	77	74	95	Oct
Cork Harbour	56*	65*	85	62	71	93	57	74	93	Dec, Jan
Lough Derravaragh	124	236	32	96	95	110	35	74	110	Jan
Lough Ennell	259	124	46	63	83	65	98	71	98	Sep, Nov
Ballyallia Lake [1]	80	64	39	35	63	116	50	61	116	Dec
Tacumshin Lake	21	30	17	35	28	72	122	55	122	Nov
Lough Kinale & Derragh Lough [1]	29*				37	61	55	51	61	Sep
North Wicklow Coastal Marshes	51	51	34	45	52	22*	42	43	52	Jan, Feb, Mar
Lough Gowna [1]				21	37	57	39	39	57	Oct
River Shannon (Lower) [1]		24	25	28	52	39	44	38	52	Nov
Lough Glore [1]	38	40	50	40	62	17	13	36	62	Nov
Shannon & Fergus Estuary [1]	7	12	15	34	32	45	54	36	54	Sep
Termon Turloughs [1]	8	58	4	18	39	62	53	35	62	Sep
Lough Sheelin	27	21	12	75	16	51	13	33	75	Feb
Donegal Bay	26	25	17	33	32	49	27	32	49	Jan
Clew Bay [1]	32	41	23	34	30	30	34	30	34	Oct
Lough Arrow [1]			34	19	28	38		30	38	
Lough Corrib [1]	55	19	32	27	27	45	5	27	45	Nov
Wexford Harbour & Slobs	24*	12*	24	4	21	32	42	25	42	

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Tramore Back Strand [1]		5	12	18	33	35		25	35	Feb
Lough Eorna [1]	21	48	36	15	16	20	32	24	36	Sep, Mar
Lough Derg (Shannon) [1]		88	24		32	18	18	23	32	Oct
Kilkeran Lake [1]	26	40	33	12				23	33	
Broadmeadow (Malahide) Estuary [1]	13	28	23	21	8	33	26	22	33	Dec
Lough Mask [1]	17	10		4*	16	27		22	27	
Marlfield Lake	30	32	20	23				22	23	
Knock Lake				16	27	10	29	21	29	Sep
Rogerstown Estuary [1]	18	10	24	15	15	22	25	20	25	Nov
Lough Rea [1]	17	22	14	18	32	20	14	20	32	
Sites no longer supporting numbers of national importance										
Lough Foyle †	35	16	23	13	10	35	7	18	35	Sep
Lough Carra	43	27	15					15	15	
Bantry Bay	8	35	6	13	11	17	10	11	17	Dec
Corofin Wetlands	27	43		31			25	11	31	Nov, Jan
Lough Owel	16	7	16	9	3	5	2	7	16	Nov

Sites that supported numbers of national importance during the former period but no data were available for the current period: Lough Ree.

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

4.34 Great Crested Grebe *Podiceps cristatus* Foitheach mór

cristatus, N. & W. Europe (br)

International threshold:	6,300	**Population change (%):**	
All-Ireland threshold:	30	5 year:	-31.7
Population size (2011-2016):		12 year:	-7.6
All-Ireland:	2,930	22 year:	+4.8
ROI:	1,734	Historical:	-
Associated with SPA network:	1,298	Average annual change:	-0.1

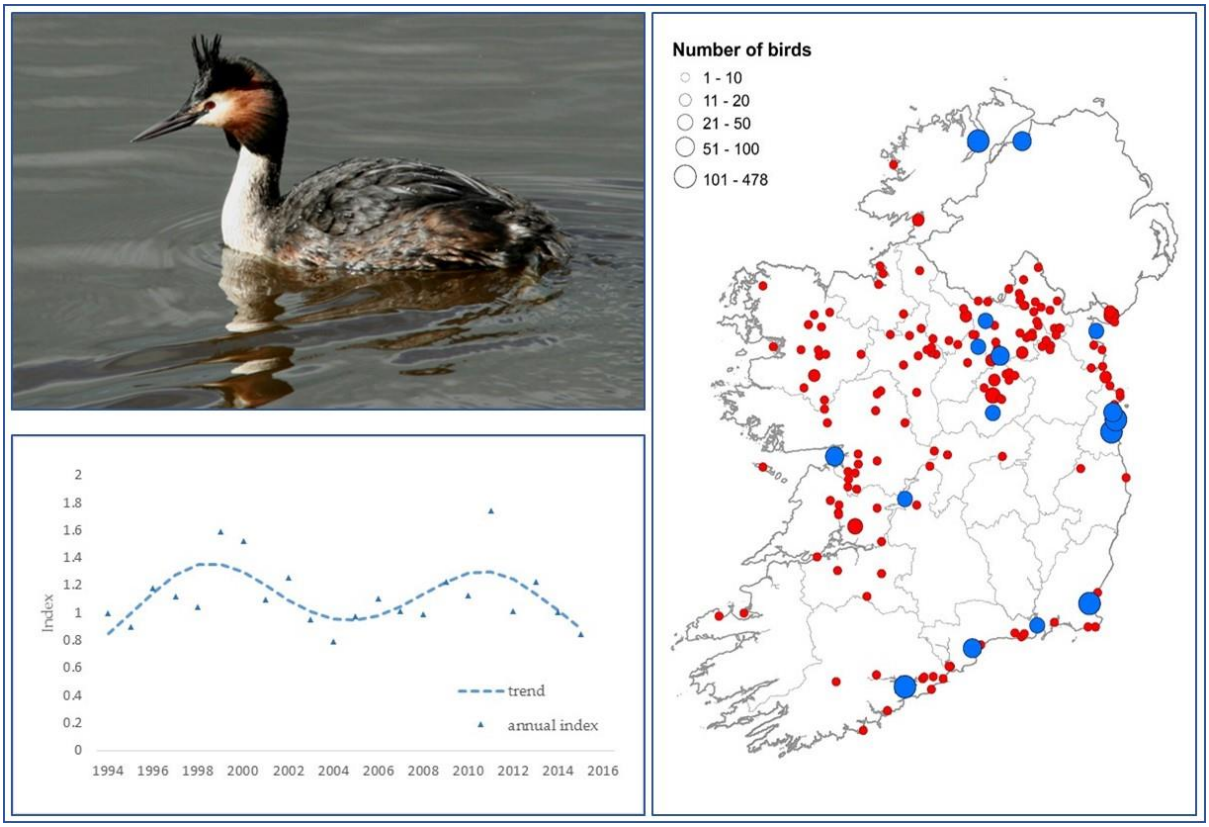


Figure 35 Distribution map and graphed population trend for Great Crested Grebe. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the smoothed trend (hatched line) (Photo: Dick Coombes).

Wetlands International (2018) recognises five populations of *Podiceps cristatus*, and birds occurring in Ireland belong to the population that breeds across north and west Europe, including Scandinavia, Germany, Switzerland and Italy. The population trend of this species is uncertain (stable/declining) (Wetlands International, 2018). In Ireland, numbers have been stable across the long-term but a short-term decline (over 5- and 12-year periods) is now evident. This is similar to Britain where a 20% decline in numbers over the past ten years has been reported (Frost *et al.*, 2018).

Great Crested Grebe are relatively widespread in Ireland and were recorded at 176 sites during the current period. Some 16 sites recorded numbers of national importance (Table 34), with Dublin Bay ranked the highest, with mean numbers more than four times higher than the former period, and a peak count of 930 individuals. Numbers at Lough Swilly, Wexford Harbour & Slobs and Cork Harbour are relatively stable in comparison with the former period. Notably, Carlingford Lough (NI) was the highest ranked site during the former period but is now no longer of significance.

Table 34 Table showing sites supporting nationally important numbers of Great Crested Grebe ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Dublin Bay	255	421	930	254	755	143	307	478	930	Nov
Lough Swilly	296	110	255	150	196	161	166	186	255	Nov
Wexford Harbour & Slobs	19*	103*	76	24	233	215	76	125	233	Nov
Cork Harbour	183*	140*	154	117	82	94	87	107	154	Oct, Feb
Baldoyle Bay [1]	63				124	189		104	189	Nov, Dec
Broadmeadow (Malahide) Estuary	54	44	34	120	60	72	84	74	120	Nov
Lough Foyle †	160	37	20	45	158	76	70	74	158	Oct
Dungarvan Harbour [1]	12	59	112	103	50	52	22	68	112	Jan
Inner Galway Bay [1]	48	40	84	27	53	69	33	53	84	Nov
Lough Sheelin	24	21	29	41	78	64	41	51	78	Jan
Lough Gowna [1]		3		26	53	61	47	47	61	Sep, Mar
Waterford Harbour [1]	69		24		62			43	62	
Lough Derg (Shannon) [1]		171	41		41	61	22	41	61	Sep, Mar
Lough Ennell [1]	25	36	58	23	54	39	21	39	58	Mar
Dundalk Bay	48	31	45	73	1	19	43	36	73	Jan
Lough Oughter Complex		8*	44	18*	27	3*		36	44	
Sites no longer supporting numbers of national importance										
Carlingford Lough †	186	110	68	2	2	6	3	16	68	Jan

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

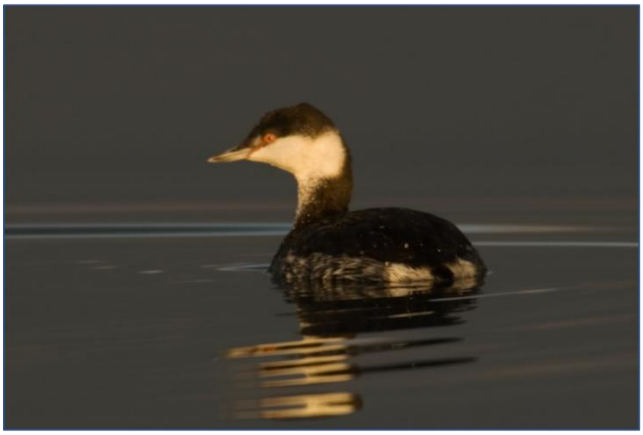
4.35 Slavonian Grebe *Podiceps auritus* Foitheach cluasach

auritus, N.W. Europe (br)

Scarce winter visitor

International threshold: 50

Mean/ Peak (2011/12 – 2015/16): 86/153



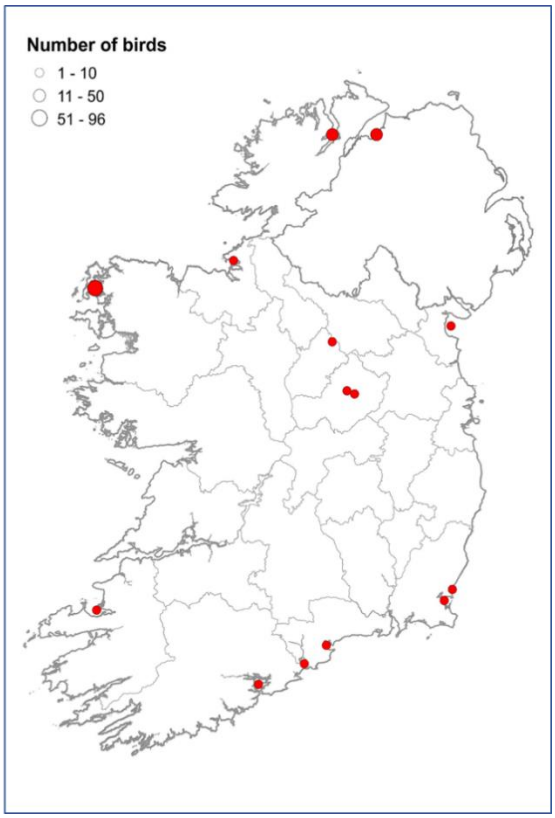


Figure 36 Distribution map for Slavonian Grebe showing peak counts (2011/12 – 2015/16) (Photo: Clive Timmons).

The north-west European population of Slavonian Grebe is one of three populations recognised by Wetlands International (2018) and is declining/stable. The species is relatively scarce in Ireland, with a predominantly coastal distribution (Balmer *et al*., 2013). This species was recorded at 14 sites during the current period, occurring regularly at five sites (Table 35).

Lough Swilly and Blacksod & Tullaghan Bays held the largest numbers based on the five-year mean (2011/12-2015/16), consistent with the former period, while Lough Foyle (NI) also recorded the highest mean number of 22 birds for the same period, and the highest peak number (43) of individuals during 2013/14.

Table 35 Table showing sites that supported Slavonian Grebe in five or more seasons between 2009/10 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Blacksod & Tullaghan Bays	13	1	12	36	20	10	96	35	96	Feb
Lough Foyle †	60	11	7	3	43	22	37	22	43	
Lough Swilly	46	4	10	24	20	19	10	17	24	Feb
Wexford Harbour & Slobs	2	5	3	4	3	4	8	4	8	Jan
Dundalk Bay	1			6	4	3	2	3	6	Mar

† Data provided by the UK (WeBS).

Other sites recorded in less than five seasons (peak count 2011/12 – 2015/16): Blackwater Estuary (1), Cork Harbour (1), Drumcliff Bay Estuary (2), Dungarvan Harbour (2),), Lough Gowna (1), Lough Owel (2), Slevin's Lake (1), Tralee Bay, Lough Gill & Akeragh Lough (3), Wexford Bay (8).

4.36 Cormorant *Phalacrocorax carbo* Broigheall

carbo, N.W. Europe (br)

International threshold:	1,200	**Population change (%):**	
All-Ireland threshold:	110	5 year:	-5.0
Population size (2011-2016):		12 year:	-27.7
All-Ireland:	10,870	22 year:	+6.9
ROI:	7,967	Historical:	+3.7
Associated with SPA network:	3,263	Average annual change:	+0.1

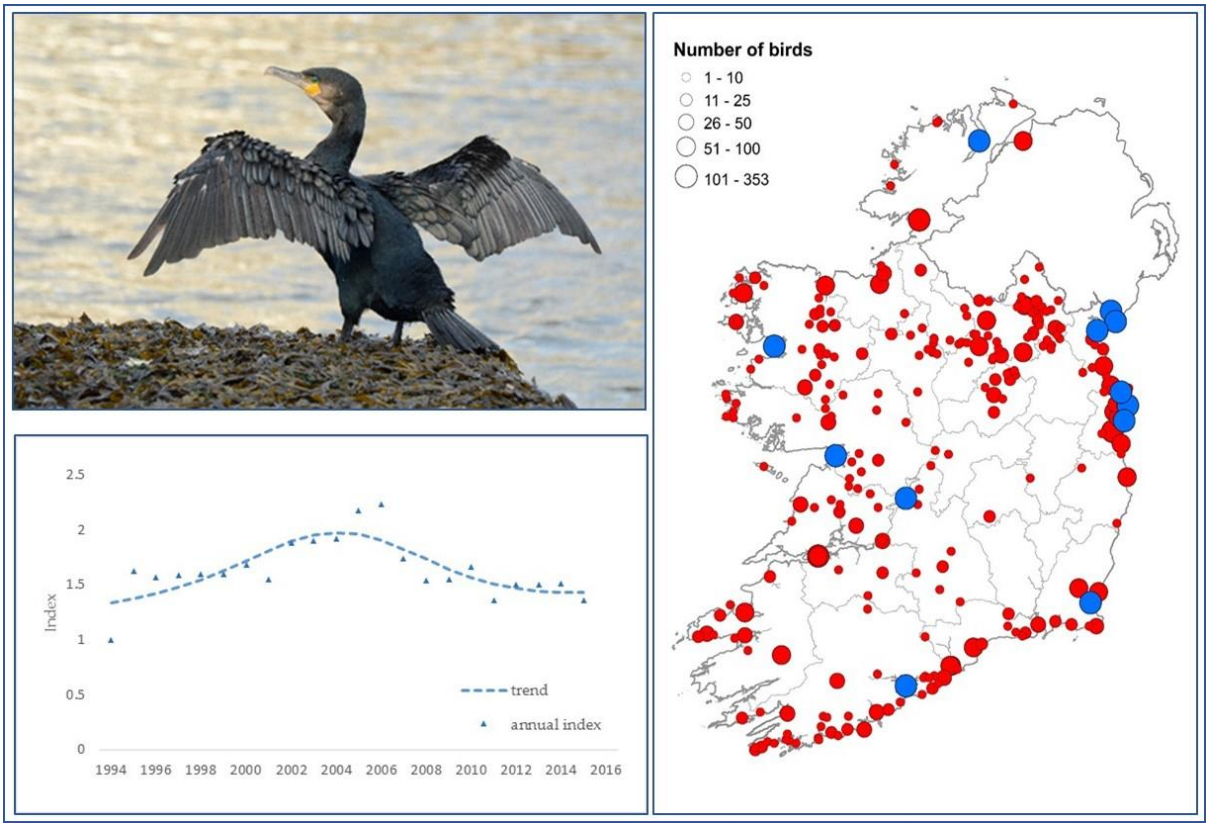


Figure 37 Distribution map and graphed population trend for Cormorant. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the smoothed trend (hatched line) (Photo: Brian Burke).

There are 15 populations of Great Cormorant (hereafter Cormorant) (Wetlands International, 2018), distributed over much of Europe as well as parts of Africa, Asia, America and Australia. Birds breeding and wintering in Ireland belong to the north-west European population, predominantly the subspecies *carbo* that also occurs in Norway, Iceland and Britain. It is likely that Cormorants of the subspecies *sinensis* (Northern and Central European population) are also present here in significant but unquantified numbers (Newson *et al.*, 2004). The majority of breeding Cormorant in Ireland are thought to be resident, although some have been recorded moving south for the winter, with

recoveries from northern France and the south coast of Portugal (Wernham *et al*., 2002). Wintering numbers have declined in Ireland over much of the last 40 years – by 9% since the 1980s (Sheppard, 1993), 27.7% in the last 12 years, and by 5% in the last 5 years. In the UK, by contrast, the 25-year and 10-year trends show that numbers of Cormorant have increased by 51% and 11% respectively (Frost *et al*., 2018), boosted by increased wintering numbers from the continent (Newson *et al*., 2007).

The largest concentrations of wintering Cormorant in Ireland is within coastal bays, although the species is widespread inland too, particularly on the larger lakes and parts of the north midlands and west of the country where there are high densities of waterbodies with fish. Cormorant were recorded at 278 sites during the current period. The list of sites supporting numbers of national importance has increased from 9 to 12, all but one of which are coastal sites. The recent Bird Atlas (Balmer *et al*., 2013) found a net 18% increase in the range of Cormorant wintering in Ireland since the previous atlas in 1981-84, the majority of new sites being inland. It is worth noting that this is a species that is liable to be under-recorded during core I-WeBS counts, particularly in coastal areas.

Table 36 Table showing sites supporting nationally important numbers of Cormorant ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Wexford Harbour & Slobs	196*	218*	393	463	328	395	188	353	463	Jan
Cork Harbour	170*	283*	317	363	263	330	401	335	401	Nov
Inner Galway Bay	204	497	194	290	270	665	144	313	665	Nov, Jan
Carlingford Lough †	381	91	52	153	131	355	378	214	378	Jan
Lambay Island [1]	50				200		20*	200	200	
Lough Swilly [1]	83	174	109	60	190	95	536	198	536	Oct, Jan
Skerries Islands					340		25	183	340	Nov, Jan
Ireland's Eye [1]					200		150	175	200	
Dundalk Bay Outer (North: Ballagan Point - Giles Quay) [1]	228	110*	103	156	220	50*	203	171	220	Jan
Dundalk Bay	256	127	155	139	142	94	104	127	155	Sep
Clew Bay [1]	34	249	220	182	83	70	72	125	220	Oct
Lough Derg (Shannon) [1]		149	62		116	153	163	124	163	Oct
Sites no longer supporting numbers of national importance										
Shannon & Fergus Estuary	49	83	86	187	40	118		108	187	Jan
Dublin Bay	211	98	151	53	198	41	71	103	198	Oct
Carlingford Lough (ROI)	58*		49				13	31	49	

Sites that supported numbers of national importance during the former period but no data were available for the current period: Ballagan Point – Cooley Point.

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS.

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

4.37 European Shag *Phalacrocorax aristotelis* Seaga

aristotelis, Coastal N Europe (br)

International threshold: 2,000

Mean/ Peak (2011/12 – 2015/16): 1,500/1,948

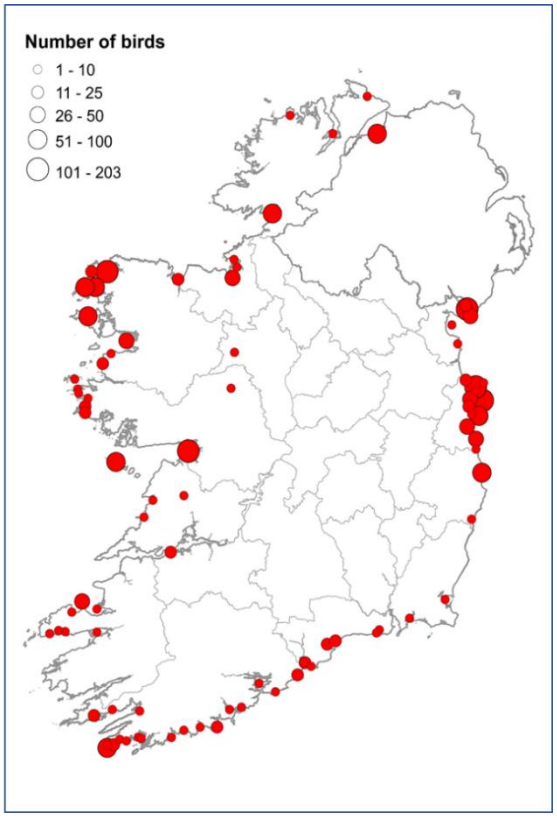


Figure 38 Distribution map for Shag showing sites that supported an average one or more bird between 2011/12 and 2015/16 (Photo: Paul Troake).

There are three populations of European Shag (hereafter Shag) that occur predominantly in coastal waters between northern Europe and Morocco. The nominate subspecies *aristotelis* inhabits coastal northern Europe, including Ireland. Shag dispersal is limited and birds seen around the Irish coast in winter are unlikely to have bred much further away than 100km or so (Wernham *et al*., 2002).

Because of their pelagic nature, Shag are not monitored accurately by I-WeBS counts, although they are often recorded in significant numbers at sites around the coast. Some 17 sites are listed in Table 37 as supporting 20 or more individuals on a regular basis and these provide some indication of important inshore areas used by the species.

Table 37 Table showing sites that supported Shag in five or more seasons between 2009/10 and 2015/16 with a mean peak of 20 individuals or greater.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Inner Galway Bay	211	177	388	163	214	166	82	203	388	Jan
Broadhaven & Sruwadaccon Bays	246	254	349	102	165	115		183	349	Nov
Blacksod & Tullaghan Bays	52	28	125	106	110	41	96	96	125	Feb
Inishmore, Aran Islands [6]		22	61	199	36	93	79	94	199	Oct, Dec
North Wicklow Coastal Marshes	9	106	176	54	46	44*	78	89	176	Jan
Donegal Bay	79	81	16	84	66	89	56	62	84	Oct
Achill Island [6]		12	17	21	67	56	99	52	99	Sep, Oct
Mullet West	61	70	55	54	62	32		51	62	
Ballysadare Bay	27	316	42		25	113	4	46	113	Jan
Clew Bay[6]	16	18	6	17	37	75	31	33	75	Oct, Nov
Rogerstown Estuary	28	44	40	47	36	21	10	31	47	Oct
Dublin Bay [6]	2	25	19	23	36	3	71	30	71	
Dundalk Bay Outer (North: Ballagan Point – Giles Quay) [6]	4	15		58	38	20	12	26	58	
Mannin Bay	5	12	5	11	36	31	41	25	41	Sep, Oct
South Mayo Coast [6]	80	100	7	63	4	11	30	23	63	Sep, Nov
Carlingford Lough †	1	12	2	6		54	51	23	54	
Dungarvan Harbour [6]	1	15	8	39	27	25	10	22	39	Feb

† Data provided by the UK (WeBS).

[6] Species not regularly recorded at the site during the former period (2001/02 and 2008/09).

4.38 Little Egret *Egretta garzetta* Éigrit bheag

garzetta, W Europe (br)

International threshold:	1,100	**Population change (%):**	
All-Ireland threshold:	20	5 year:	+8.0
Population size (2011-2016):		12 year:	+76.8
All-Ireland:	1,390	22 year:	+3,747.2
ROI:	1,274	Historical:	-
Associated with SPA network:	957	Average annual change:	+27.2

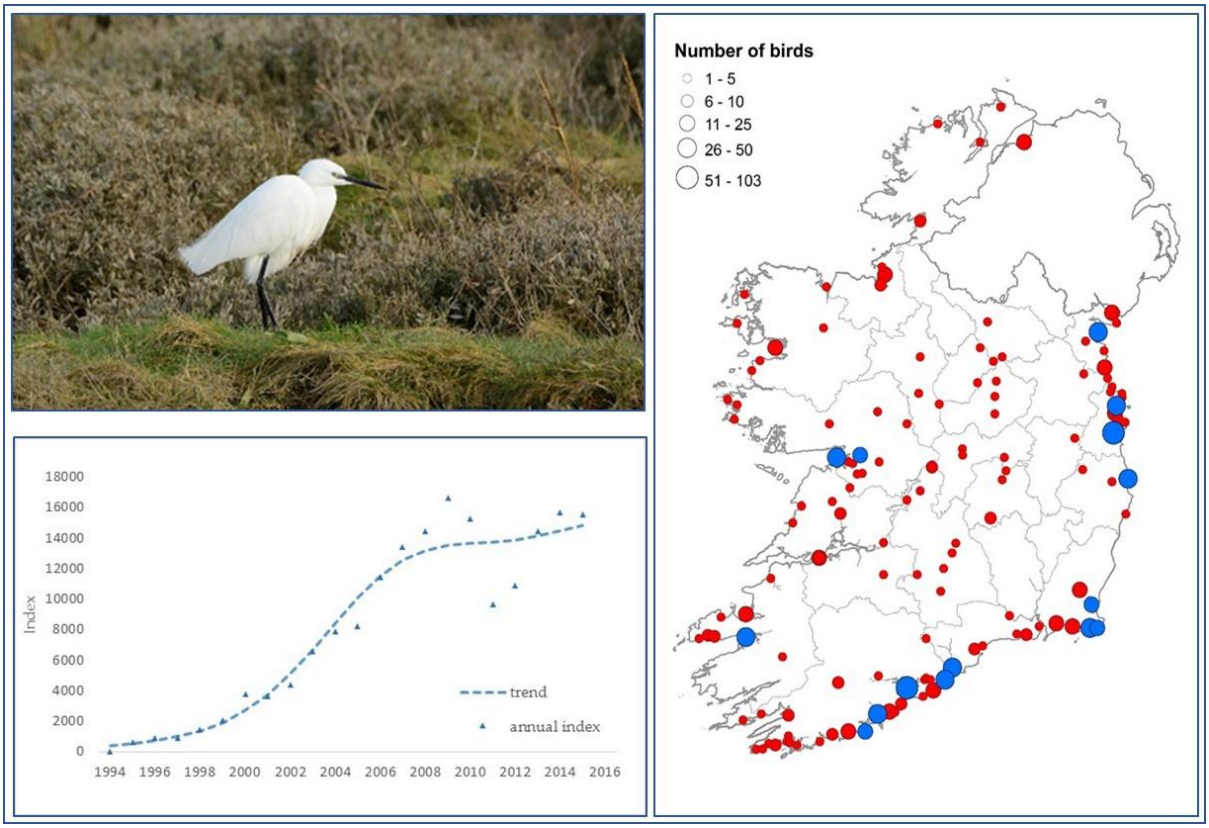


Figure 39 Distribution map and graphed population trend for Little Egret. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the smoothed trend (hatched line) (Photo: Brian Burke).

Wetlands International (2018) recognises four populations of Little Egret. The population that breeds in Ireland and the UK and south-east to Italy, Algeria, Tunisia and Morocco is in decline. However, Little Egret in Ireland have continued to expand in range and numbers since they became established here during the late 1990s (Smiddy & Duffy, 1997; Smiddy & O'Sullivan, 1999), and the colonisation and range expansion is one of the most notable of any bird in Britain and Ireland over the past 20 years (Balmer *et al.*, 2013). It is likely that increases in breeding and wintering populations in France and Spain during the 1980s and 1990s coincided with the expansion into Britain and Ireland (Balmer *et al.*, 2013) and there has been an average annual increase of 27% throughout I-WeBS.

Little Egret were recorded at 140 sites during the current period, compared with 117 during the former period. Their distribution remains predominantly coastal, especially in the south (where the breeding population originated) and east, although the number of inland sites has also increased. Fifteen sites exceeded the nominal threshold of 20 birds (Table 38). Cork Harbour remains the most important site, with Dublin Bay and Rogerstown Estuary still ranked highly. While the five-year mean for Carlingford Lough (NI) did not exceed the 1% threshold, a peak count in 2015/16 (41 birds) did exceed this threshold.

Table 38 Table showing sites supporting nationally important numbers of Little Egret ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Cork Harbour	184*	121*	67	64	83	131	168	103	168	Sep
Dublin Bay	87	73	48	19	59	69	59	51	69	Sep, Oct
Rogerstown Estuary	42	1	43	48	57	46	55	50	57	Sep
Inner Galway Bay [1]	44	35	26	19	46	84	32	41	84	Nov
Castlemaine Harbour & Rossbehy [1]	18*	53	24	36	35	53	37	37	53	Oct
Dundalk Bay	40	29	34	35	35	30	48	36	48	Sep
Blackwater Estuary	41	39*	17	19	40	36	54	33	54	Sep
Ballymacoda	18*	30*	32	23		42	36	33	42	Sep
Bandon Estuary [1]					31			31	31	
North Wicklow Coastal Marshes [1]	42	33	10	18*	50	8*	28	29	50	Sep, Oct
Tacumshin Lake	15	10	10	29	14	11	77	28	77	
Rahasane Turlough [1]	67	9	41	14	32	21	13	24	41	Mar
Lady's Island Lake [1]	20	91	22	9	28	35	25	24	35	Sep
Courtmacsherry Bay, Broadstrand Bay & Dunworley	38	21	19	8	31	25	31	23	31	Sep
Wexford Harbour & Slobs	5*	20*	15	19	27	30	19	22	30	Oct
Sites no longer regularly supporting 20 birds or more										
Bannow Bay	145		39		12	12	13	19	39	
The Cull & Killag (Ballyteige)	24	5	12	22	9	28	17	18	28	Sep
Baldoyle Bay	56				18	3	7	9	18	Oct

* Low-quality count not included in the calculation of the mean.

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

4.39 Grey Heron *Ardea cinerea* Corr réisc

cinerea, N. & W. Europe (br)

International threshold:	5,000	**Population change (%):**	
All-Ireland threshold:	25	5 year:	+1.9
Population size (2011-2016):		12 year:	-12.9
All-Ireland:	2,610	22 year:	+31.9
ROI:	1,943	Historical:	-
Associated with SPA network:	850	Average annual change:	+0.9

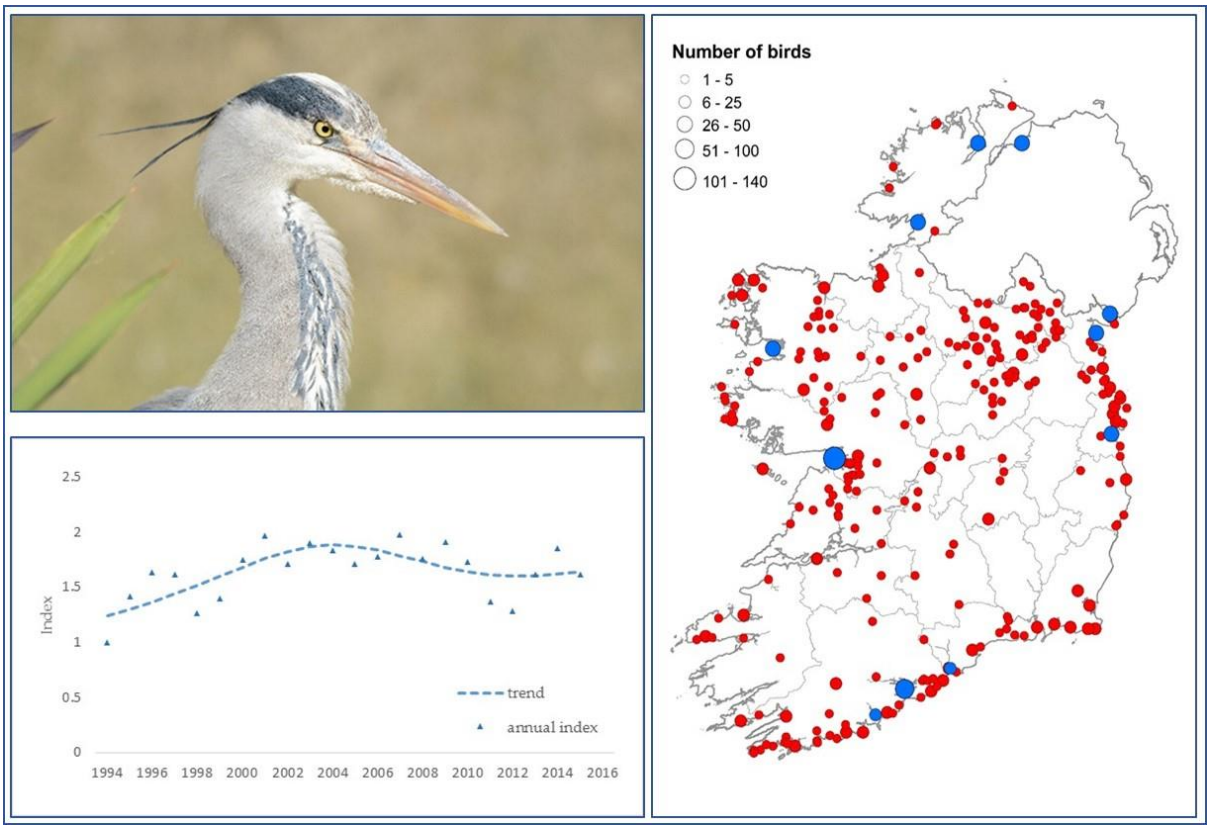


Figure 40 Distribution map and graphed population trend for Grey Heron. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Brian Burke).

Wetlands International (2018) recognise four populations of *Ardea cinerea*, and the population that breeds across north and western Europe is declining. Resident in Ireland, wintering numbers are augmented by birds moving in from the north and east (Wernham *et al*., 2002). Grey Heron numbers have shown a gradually increasing trend throughout I-WeBS (Figure 40).

Grey Heron are found in a variety of freshwater wetlands as well as estuaries and rocky shores. About a third of the wintering population was estimated to use non-estuarine shores during the last non-estuarine coastal waterbird survey NEWS-III (Lewis *et al*., 2017) and given the widespread nature of the species, the flyway and all-Ireland estimates should be treated as known underestimates.

Widely distributed in Ireland, Grey Heron are usually recorded in small numbers at most sites. They were recorded at 285 sites during the current period and 11 sites were identified as supporting numbers of national importance including the two cross-border sites Carlingford Lough and Lough Foyle. Inner Galway Bay, Cork Harbour, Lough Swilly and Clew Bay remain the top ranked sites with relatively stable numbers compared with the former period.

Table 39 Table showing sites supporting nationally important numbers of Grey Heron ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Inner Galway Bay	56	152	136	118	155	212	77	140	212	Nov
Cork Harbour	59*	75*	70	49	78	99	110	81	110	Sep
Lough Swilly	38	64	45	35	52	56	59	49	59	Nov, Jan
Clew Bay	27	57	36	51	36	34	77	47	77	Oct
Dublin Bay	54	30	28	15	68	40	44	39	68	Oct
Donegal Bay	52	34	13	45	40	60	31	38	60	
Carlingford Lough †	30	14	17	13	10	62	53	31	62	Jan, Feb
Dundalk Bay	50	18	25	16	43	26	36	29	43	Nov
Lough Foyle †	30	36	22	12	27	51	39	29	51	Sep
Blackwater Estuary [1]	21	25*	16	12	38	42	17	25	42	
Bandon Estuary [1]					25			25	25	
Sites no longer supporting numbers of national importance										
Broadmeadow (Malahide) Estuary	77	20	12	19	19	27	26	21	27	Oct

Sites that supported numbers of national importance during the former period but no data were available for the current period: Dublin Zoo Ponds.

* Low-quality count not included in the calculation of the mean.

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

† Data provided by the UK (WeBS).

4.40 Water Rail *Rallus aquaticus* Rálóg uisce

aquaticus, Europe, N. Africa, W. Asia (br)

International threshold: 6,400

Mean/ Peak (2011/12 – 2015/16): 46/67

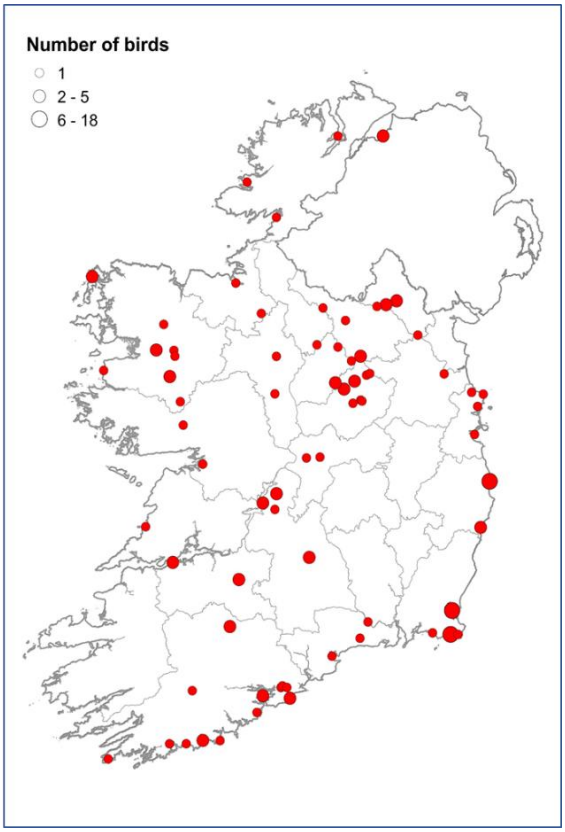


Figure 41 Distribution map for Water Rail showing peak numbers recorded at sites between 2011/12 and 2015/16 (Photo: Shay Connolly).

Ireland's Water Rail belong to the population that breeds in Europe, north Africa, western Asia and east to the Ob basin, and winter in western Europe, north Africa and south-west Asia. The status of this population is unknown (Wetlands International, 2018). Ringing recoveries show that the resident Irish Water Rail population is augmented in the winter by birds from Fennoscandia and central Europe (Wernham *et al*., 2002).

The species requires muddy ground for foraging and shows a preference for shallow still or slow-flowing water, surrounded by dense riparian, emergent, submergent or aquatic vegetation (del Hoyo *et al*., 1996). Water Rail are highly secretive and therefore is not accurately monitored by I-WeBS core count methodology alone. They were recorded at 87 sites between 2009/10 and 2015/16, and at 72 sites during the current period, with ten sites supporting the species with most regularity (Table 40). A peak count (18) was recorded at North Wicklow Coastal Marshes in 2014/15.

Table 40 Table showing sites that supported Water Rail in five or more seasons between 2009/10 and 2015/16

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15
North Wicklow Coastal Marshes	7	4	5	3	5	18	6	7	18
Tacumshin Lake [6]	1	1		1	1	1	12	4	12
Wexford Harbour & Slobs	6	4	3	2	6	3	3	3	6
Cabragh Wetlands	2	4	1	2	2	4	2	2	4
Lough Iron	3	2	2	2	1	2	1	2	2
Clonakilty Bay [6]	3	2	3			1	2	1	3
Lough Foyle [6] †		2	1		2	3	1	1	3
Kilcolman Marsh [6]	3	2	2	1	1	1	2	1	2
Lough Derravaragh [6]	1	2	1			2	1	1	2
Lough Glore [6]	3	3	1	1	1			1	1

† Data provided by the UK (WeBS).

[6] Species not regularly recorded at the site during the former period (2001/02 and 2008/09).

Other sites recorded in less than five seasons (peak count 2011/12 – 2015/16):

Annaghmore Lakes (1), Arklow Ponds (2), Ballindeereen Turlough (1), Ballinlough (1), Ballybackagh (1), Ballybutler (Butlerstown) Lake (1), Ballycotton Shanagarry (3), Ballysadare Bay (1), Boora Lakes - Back Lakes Finnamores (1), Castlebar Lakes/ Islandeady chain (2), Castlemartyr Lake (1), Cloghanhill (1), Cork Harbour (4), Courtmacsherry Bay, Broadstrand Bay & Dunworley (1), Donegal Bay (1), Dromore Lakes (Monaghan) (2), Dromore River (2), Drum Lakes (1), Dublin Bay (1), Dungarvan Harbour (1), East Ballinamore Lakes (1), Glen Lough (4), Inishcarra Reservoirs (1), Knock Lake (1), Lady's Island Lake (1), Lissagriffin Lake (1), Lough Aderry (1), Lough Arrow (1), Lough Carra (3), Lough Corrib (1), Lough Derg (Shannon) (2), Lough Eorna (1), Lough Gowna (1), Lough Gur (2), Lough Kinale & Derragh Lough (1), Lough Levally (1), Lough Oughter Complex (1), Lough Sallagh (1), Lough Sheelin (3), Lough Sheever (1), Lough Swilly (1), Manulla Lakes (1), Mid-Clare Coast (Mal Bay - Doonbeg Bay) (1), Pat Reddan's Lake (2), Rahans Lake (1), Ringabella Creek (1), River Boyne (1), River Suir Lower (1), Rogerstown Estuary (1), Rosscarbery (1), Shannon & Fergus Estuary (2), Sheskinmore Lough (1), Shreeland Lakes (incl. Lough Doo) (1), Skerries Islands (1), Slevin's Lake (1), South Mayo Coast (1), Southern Roscommon Lakes (1), Termoncarragh & Annagh Marsh (2), The Cull & Killag (Ballyteige) (1), Walshestown South Turlough (1), Washpool Lough (1), White/Annagh Lough (1).

4.41 Moorhen *Gallinula chloropus* Cearc uisce

chloropus, Europe & N Africa (br)

International threshold: 37,100

All-Ireland threshold: -

Mean/ Peak (2011/12 – 2015/16): 739/867

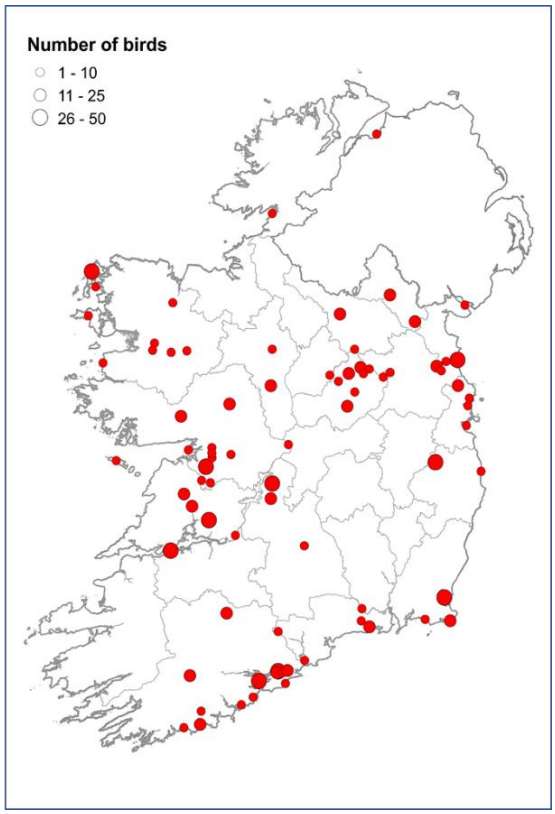


Figure 42 Distribution map for Moorhen showing sites that supported an average one bird or more between 2011/12 and 2015/16 (Photo: Brian Burke).

Ireland's wintering and breeding Moorhen belong to the population that breeds in Europe and north Africa, and winters in Europe, northern Africa and sub-Saharan Africa (Wetlands International, 2018). This population is thought to be stable/in decline (Wetlands International, 2018).

Moorhen is a skulking species that is difficult to monitor effectively through I-WeBS methodology alone, thus their wintering status in Ireland is unknown. Moorhen are widely distributed in a variety of wetland types throughout the country, including small wetlands that are not monitored during I-WeBS. While it is often possible to detect their presence as they are quite vocal, they tend to occur in fringe vegetation, thus ascertaining true numbers is almost impossible at most sites. The site totals presented here should be treated as underestimates.

Moorhen were recorded at 225 sites between 2011/12 and 2015/16, and some 79 sites supported the species on a regular basis.

Table 41 Table showing sites that supported Moorhen in five or more seasons between 2009/10 and 2015/16 with a mean peak of 15 individuals or greater between 2011/12 – 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15
Boyne Estuary [6]	31	61	50	25	30	32	1	28	50
Cork Harbour	22	35	21	15	28	38	25	25	38
Shannon & Fergus Estuary [6]	17	26	18	26	25	34	21	25	34
Lough Aderry [6]	12	10	11	25	21	36	9	20	36
Wexford Harbour & Slobs [6]	38	13	14	13	16	32	21	19	32
Southern Roscommon Lakes [6]	11	15	14	24	20	20	11	18	24
South East Clare Lakes [6]	24	8	12	39	9	20	7	17	39
Pat Reddan's Lake [6]	11	34	11	6	11	13	34	15	34

[6] Species not regularly recorded at the site during the former period (2001/02 and 2008/09).

Other sites recorded in five or more seasons (peak count 2011/12-2015/16):

Achill Island (7), Annaghmore Lakes (7), Ballinlough (Westmeath) (2), Ballyallia Lake (19), Ballyboy (6), Ballybutler (Butlerstown) Lake (13), Ballycotton Shanagarry (6), Ballyhonock Lough (17), Ballyshunnock Reservoir (22), Blacksod & Tullaghan Bays (6), Blackwater Callows (5), Blackwater Estuary (4), Brees Wetlands (4), Broadmeadow (Malahide) Estuary (9), Cabragh Wetland (5), Carlingford Lough (NI) (6), Cashel Turlough (4), Castlebar Lakes/ Islandeady chain (7) Castlemartyr Lake (9), Clonakilty Bay (15), Corofin Wetlands (15), Donegal Bay (3), Donore Bog (10), Dromore River (17), Dublin Bay (7), Glen Lough (5), Hynestown Lake Naul (20), Inishcarra Reservoirs (11) Inishmore, Aran Islands (5), Inner Galway Bay (5), Kilcolman Marsh (11), Killineer Quarry, Drogheda (3), Knockaderry Reservoir (6), Lady's Island Lake (18), Lough Alick (2), Lough Bane (1), Lough Corrib (15), Lough Cutra - Ballynakill L. (1), Lough Derravaragh (17), Lough Ennell (13), Lough Eorna (11), Lough Foyle (NI) (6), Lough Glore (11), Lough Iron (4), Lough Lene (2), Lough Oughter Complex (11), Lough Rea (4), Lough Sheelin (7), Lydacan Castle Turlough (36), Madame Lake (Bateman's Lough) (8), Monalty Lough (11), North East Galway Lakes (16), North Wicklow Coastal Marshes (6), Pollnagarragh Marshes (5), Poulaphouca Reservoir (28), Rahasane Turlough (3), Ringabella Creek (6), River Boyne (17), River Shannon (Lower) (7), River Suir Lower (5), Rogerstown Estuary (8), Rosscarbery (4), Shannon Callows (4), Slevin's Lake (2), South Mayo Coast (4), Stick Estuary (Oysterhaven) (3), Termon Turloughs (7), Termoncarragh & Annagh Marsh (27), The Cull & Killag (Ballyteige) (5), Wetland near Drumcarrabaun (Belcarra/Ballyglass Road) (7), White Lough (6).

4.42 Coot *Fulica atra* Cearc cheannann

atra, E. N. & W Europe (br)

International threshold:	15,500	**Population change (%):**	
All-Ireland threshold:	190	5 year:	-32.9
Population size (2011-2016):		12 year:	-35.3
All-Ireland:	18,520	22 year:	-15.4
ROI:	13,303	Historical:	-
Associated with SPA network:	12,280	Average annual change:	-0.1

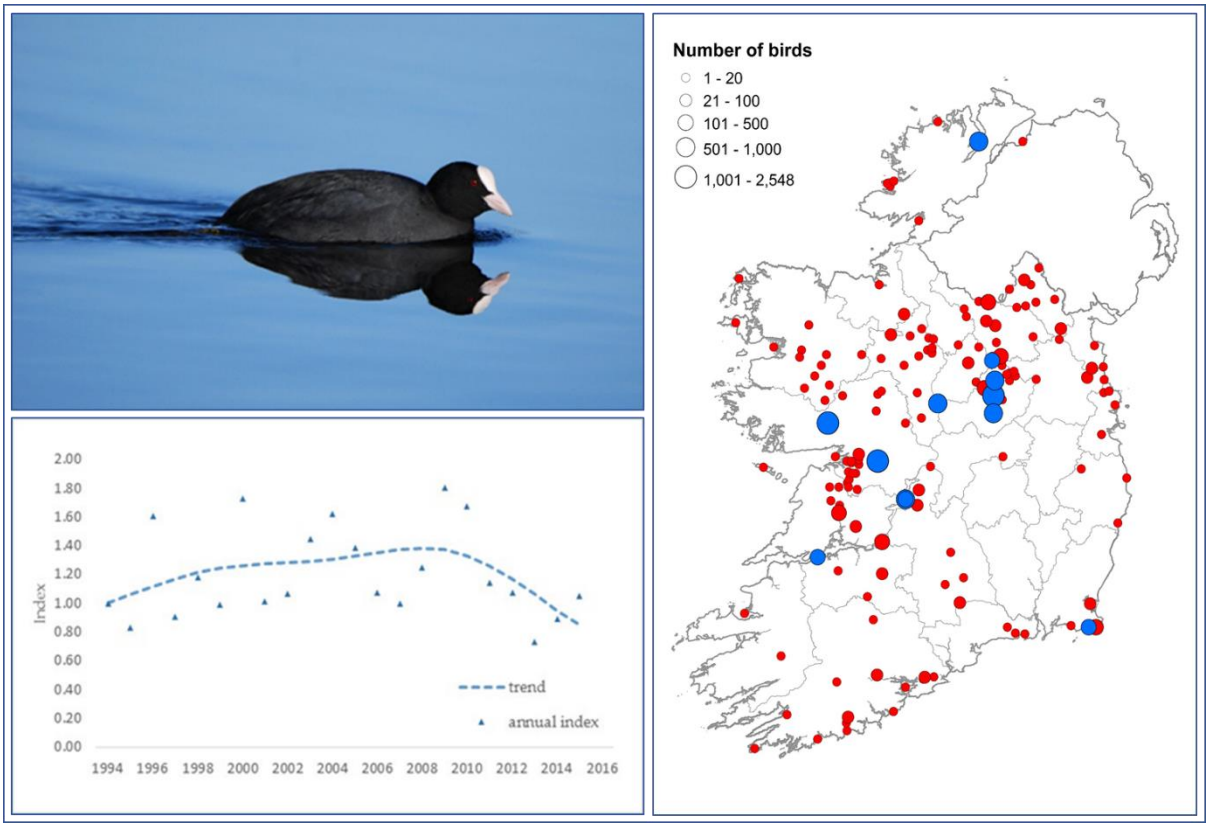


Figure 43 Distribution map and graphed population trend for Coot. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Brian Burke).

Wetlands International (2018) recognises three populations of (Common) Coot, and the nominate race *F. a. atra* occurs through Eurasia and northern Africa. Coot that winter in Ireland belong to the population that breeds in east, north and western Europe, and winters in north-west Europe. This population is thought to be stable/in decline (Wetlands International, 2018).

Numbers of Coot have fluctuated widely throughout I-WeBS but showed a pattern for increasing numbers up until 2010, with numbers decreasing thereafter. This trend is broadly consistent with the UK where a decline has also been noted over the past decade (Frost *et al*., 2018). In Northern Ireland,

the annual index reached its lowest level after a steep decline in 2008/09 and despite a small recovery in numbers since then, the long-term trend is for decline (Frost *et al*., 2018).

Coot distribution is widespread because they favour a range of wetlands from lakes, ponds, gravel pits, and canals to slow-moving rivers, open marshes and lagoons (e.g. del Hoyo *et al*., 1996). However, one general requirement is the accessibility of submerged vegetation for foraging and hence shallow-water wetlands dominate the distribution during autumn migration and winter (Holm *et al*., 2011).

Coot were recorded at 158 sites during the current period, predominantly on inland wetlands and especially in the west and midlands. Some 11 sites supported numbers of national importance. The increase in sites of significance is largely due to the reduction in 1% national threshold from 330 to the current 190. Lough Corrib, Lough Owel and Lough Rea remain the highest ranked sites, but while the five-year mean has increased at Lough Rea, numbers have dropped substantially at Lough Corrib and Lough Owel. Lough Derg (Shannon) (aerial counts) and Lough Derravaragh also remain among the most important sites for this species, although numbers have dropped at both, while numbers remain relatively stable at Lough Ennel and Lough Swilly. Lough Ree recorded only one (poor quality) count of Coot during 2015/16, and with overall poor count coverage during the period assessed, an accurate assessment of the status of this site for Coot is not possible.

Table 42 Table showing sites supporting nationally important numbers of Coot ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Lough Rea	1,987	2,244	2,541	2,392	2,616	2,353	2,839	2,548	2,839	Nov
Lough Owel	5,000	3,830	1,535	2,528	2,100	2,935	1,700	2,160	2,935	Nov
Lough Corrib	10,520	9,329	7,007*	4,183	236	174	4	1,149	4,183	Nov
Lough Derg (Shannon) [4]	963	1,597	760	1,171				966	1,171	
Lough Derravargh	1,381	1,242	450	1,131	961	1,108	381	806	1,131	Jan
Lough Ennell	598	418	696	368	476	765	950	651	950	Feb
Lough Swilly	627	781	601	569	480	602	457	542	602	Nov
Lough Kinale & Derragh Lough	220*				446	289	704	480	704	
Tacumshin Lake [1]	340	270	55	330	350	580	631	389	631	Dec
Lough Derg (Shannon)		1,348	857		286	296	70	377	857	Oct
Shannon & Fergus Estuary[4, 1]		10		200				200	200	
Sites no longer supporting numbers of national importance										
Lough Sheelin	478	209	131	48	4	683	35	180	683	Jan
River Erne & lakes north of Belturbet		56*	138	42	180			120	180	

Sites that supported numbers of national importance during the former period but insufficient data were available for the current period: Lough Ree.

* Low-quality count not included in the calculation of the mean.

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[4]Aerial census data.

4.43 Oystercatcher *Haematopus ostralegus* Roilleach

ostralegus, N. C. & W Europe (br)

International threshold:	8,200	**Population change (%)**	
All-Ireland threshold:	610	5 year:	-21.5
Population size (2011-2016):		12 year:	-28.0
All-Ireland:	60,540	22 year:	+21.5
ROI:	42,875	Historical:	-7.2
Associated with SPA network:	24,178	Average annual change:	+0.8

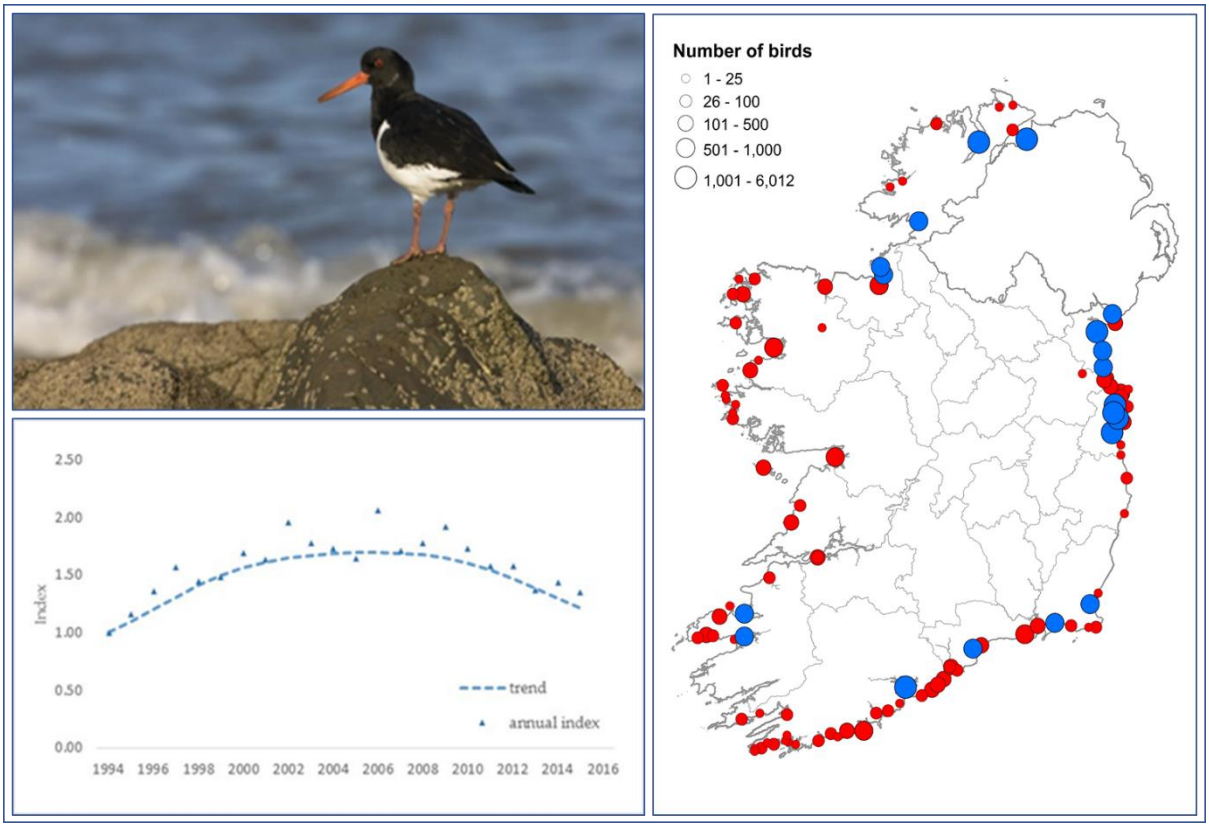


Figure 44 Distribution map and graphed population trend for Oystercatcher. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: David Dillon).

Ireland's wintering Eurasian Oystercatcher (hereafter Oystercatcher) are from the population that breeds in northern and western Europe, and that winters in western Europe and northern and western Africa (Delany *et al*., 2009). This population is considered to be declining/stable at flyway level (Wetlands International, 2018). Numbers in Ireland increased from 1994 when I-WeBS began, but the index started to downturn from around 2006 and has declined further since then (Figure 44). Similarly, in the UK, the species is showing a declining trend for the latest ten and 25-year periods (Frost *et al*., 2018).

Oystercatcher were recorded at 106 sites between 2011/12 and 2015/16, with 19 sites supporting numbers of national importance. One site, Dundalk Bay, supported numbers of international importance during the former period (2004/05-2008/09), and despite the reduction in the international threshold from 10,200 to the current 8,200, the site no longer qualifies for this status. However, despite the five-year mean declining substantially, Dundalk Bay remains the top-ranking site supporting numbers of national importance. Of the other significant sites, numbers at Lough Foyle (NI) and Dublin Bay appear relatively stable, numbers at Rogerstown Estuary have declined somewhat, while numbers Lough Swilly have increased slightly. Also, of note is a substantial decline in five-year mean at Carlingford Lough (NI). Seven sites were promoted to the list of sites supporting numbers of national importance, while three sites are no longer of significance during the current period.

Table 43 Table showing sites supporting nationally important numbers of Oystercatcher ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Dundalk Bay [3]	10,830	8,920	7,095	6,502	8,094	3,993	4,377	6,012	8,094	Oct
Lough Foyle †	3,647	2,792	2,801	3,544	4,584	2,480	3,404	3,363	4,584	
Dublin Bay	4,324	2,804	3,408	3,025	3,074	3,315	3,588	3,282	3,588	Dec
Lough Swilly	1,351	1,397	2,105	2,362	1,859	2,810	2,086	2,244	2,810	Nov
Rogerstown Estuary	2,024	1,781	2,116	2,491	1,531	1,519	1,697	1,871	2,491	Nov
Cork Harbour	1,190*	1,560*	1,939	1,294	1,452	2,334	1,274	1,659	2,334	Sep
Hick's Tower & Robswall [1]	1,013	1,750	1,500					1,500	1,500	
Broadmeadow (Malahide) Estuary	1,285	1,471	78	1,300	1,833	1,355	1,291	1,171	1,833	Oct
Boyne Estuary [1]	3,577	1,435	1,099	1,537	655	844	610	949	1,537	
Donegal Bay	1,065	1,254	994	798	839	1,160	739	906	1,160	Nov
Dungarvan Harbour	827	1,011	697	835	1,047	889	937	881	1,047	Dec
Sligo Harbour	987	601	566	949	810	809	828	792	949	Nov
Tralee Bay, Lough Gill & Akeragh Lough	1,052	943	1,021	1,032	581	608	690	786	1,032	Jan
Wexford Harbour & Slobs [1]	155*	216*	812	666	520	1,115	610	745	1,115	Jan
Dunany Point – Clogher Head [1]	1094	508	675	537	650*		770	661	770	
Carlingford Lough †	839	710	933	726	241	703	619	644	933	Jan
Castlemaine Harbour & Rossbehy [1]	1,354*	1,030	757	570	506	787	570	638	787	Oct
Drumcliff Bay Estuary [1]	875	719	872	498	563	653	568	631	872	Nov
Bannow Bay [1]	1,477		421		594	900	552	617	900	Jan
Sites no longer supporting numbers of national importance										
Baldoyle Bay	880				277	1,113	219	536	1,113	

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Waterford Harbour	328		515		446			481	515	
Nanny Estuary & shore	848	291	396*	378*	369	228	560	386	560	

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[3]Site demoted (from supporting numbers of international importance to numbers of national importance) since the 2001/02 to 2008/09 period.

4.44 Ringed Plover *Charadrius hiaticula* Feadóg chladaigh

hiaticula, N. Europe (br)

International threshold:	540	**Population change (%)**	
All-Ireland threshold:	120	5 year:	-17.9
Population size (2011-2016):		12 year:	-30.1
All-Ireland:	11,660	22 year:	-6.6
ROI:	10,545	Historical:	+19.8
Associated with SPA network:	3,065	Average annual change:	-0.03

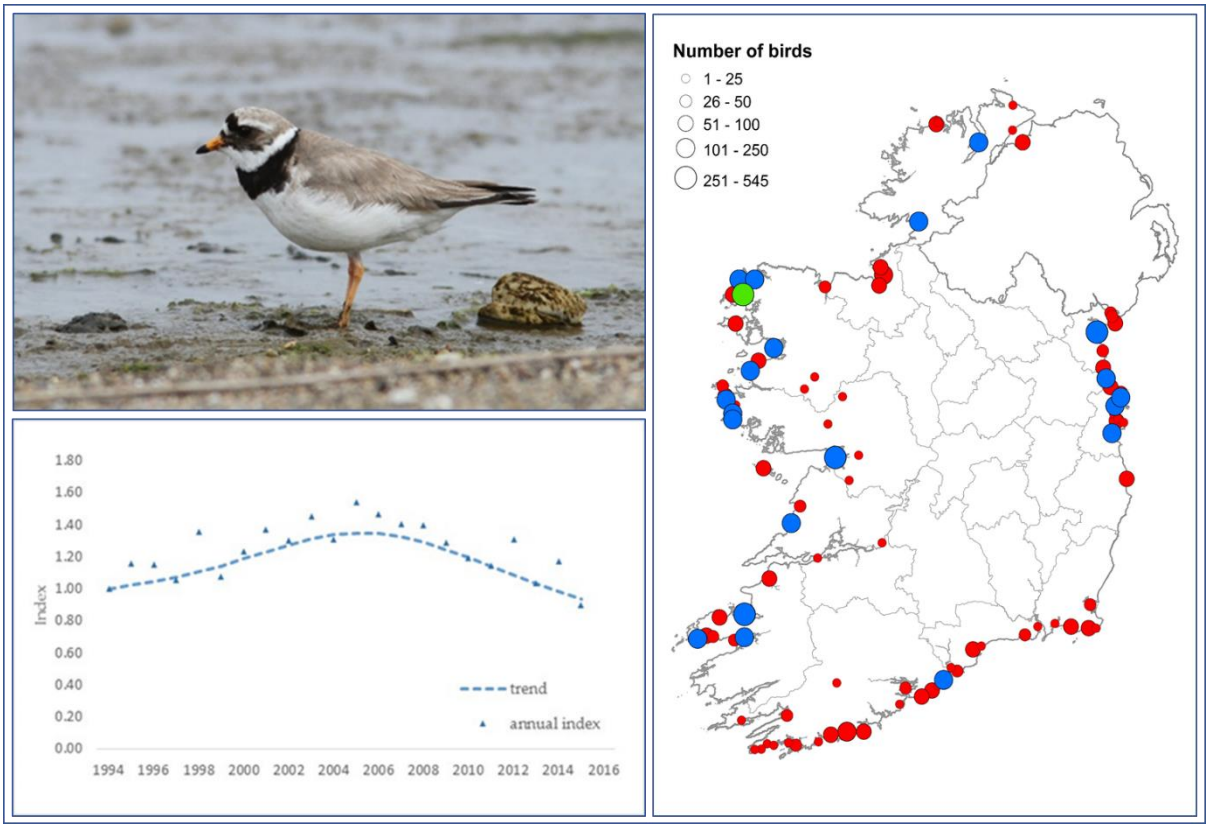


Figure 45 Distribution map and graphed population trend for Ringed Plover. The distribution map illustrates sites supporting numbers of international importance (green circles), national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Dick Coombes).

Three populations of the Common Ringed Plover (hereafter Ringed Plover) are recognised (Wetlands International, 2018). Ringed Plover that winter in Ireland originate from the nominate population that breeds in Iceland, Baltic, southern Scandinavia, Britain, Ireland and France, and winters in western Europe, the Mediterranean and north Africa (Delaney *et al.*, 2009; Wetlands International, 2018). Specifically, Ringed Plover that winter in Ireland are thought to originate from the population that breeds in western Europe, including southern Scandinavia, but Ireland also provides important

passage sites for birds breeding in east Canada, Greenland, Iceland and Fennoscandia en route to wintering areas in Africa (Wernham *et al*., 2002; Delaney *et al*., 2009).

Wetlands International (2018) have listed the flyway population of Ringed Plover as being in decline/stable, and numbers in Northern Ireland and Great Britain are in long-term decline (Frost *et al*., 2018). In contrast to Britain and Northern Ireland, the trend for Ringed Plover in the Republic of Ireland was increasing up until around 2008/09 but numbers have since been in steady decline which has resulted in a 12-year trend of -30%.

Ringed Plover were recorded at 96 sites during the current period. The international threshold now stands at 540 (Wetlands International, 2018) and one site (Blacksod & Tullaghan Bays) surpassed this threshold during the current period, after being the top ranked site that supported numbers of national importance during the former period. Five sites were promoted to the list of 20 sites supporting numbers of national importance, while three sites are no longer of significance.

Ringed Plover are widely distributed around the coast of Ireland and can also occur at a few inland sites (Balmer *et al*., 2013). Despite being associated with sandy/sandy-mud substrates (e.g. Summers *et al*., 2002), some flocks of Ringed Plover have a tendency to leave estuarine habitats at high tide to roost along open shorelines, especially where a high tide leaves few roosting options. Hence good numbers can also occur along gravelly and rocky shorelines, and Lewis *et al*. (2017) reported that over 60% of the national population of Ringed Plover can occur along non-estuarine coasts.

Table 44 Table showing sites supporting internationally and/ or nationally important numbers of Ringed Plover ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of international importance										
Blacksod & Tullaghan Bays [2]	684	709*	564	575	621	594	373	545	621	Nov
Sites supporting numbers of national importance										
Tralee Bay, Lough Gill & Akeragh Lough	111	187	180	630	536	126	145	323	630	Jan
Dundalk Bay	146	226	285	316	187	241	395	285	395	Dec
Inner Galway Bay	245	242	394	287	283	183	273	284	394	Jan
Clew Bay	267	375	142	342	309	107	259	232	342	Oct, Nov
Lough Swilly	146	178	366	80	134	386	174	228	386	Nov
Ballymacoda [1]	86*	103*	127	325		204	152*	219	325	Sep
Omey Strand	332	290	226*	194	262	248	155	215	262	Oct
Mid-Clare Coast (Mal Bay – Doonbeg Bay) [1]		95	1*	77	131	325	240	193	325	
South Mayo Coast	216	555	209	250	156	260	40	183	260	Dec
Dublin Bay	267	205	314	217	139	121	109	180	314	Sep, Nov
Rogerstown Estuary	153	113	105	284	167	161	125	168	284	Sep, Oct
Donegal Bay	45	56	60	148	140	219	237	161	237	Feb
Termoncarragh & Annagh Marsh	224	237	194	118	184	147		161	194	Nov
Skerries Coast	123*	180	113	149	150	91	171	135	171	Oct

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Nanny Estuary & Shore	184	148	110*	120*	134	124	135	131	135	Oct, Nov
Castlemaine Harbour & Rossbehy [1]	189*	100	103	197	27	258	60	129	258	Nov
Mannin Bay	158	155	98*	126	119	140	152*	128	140	Oct
Ballyconneely Bay	123	148	128*	124	143	109		125	143	Sep
Broadhaven & Sruwadaccon Bays [1]	208	62	125	95	100	160		120	160	Nov
Ventry Harbour [1]	120	80	75	112	150	199	63	120	199	Jan
Sites no longer supporting numbers of national importance										
Clonakilty Bay	184	73	129	106	68	80	150	107	150	Nov
Carlingford Lough †	54	52	99	20	20	28	38	41	99	
Hick's Tower & Robswall	185		12					12	12	

Sites that supported numbers of national importance during the former period but no data were available for the current period: Smerwick Harbour.

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[2]Site promoted (from supporting numbers of national importance to numbers of international importance) since the 2001/02 to 2008/09 period.

4.45 Golden Plover *Pluvialis apricaria* Feadóg bhui

altifrons, Iceland, Faeroes & Greenland (br)

International threshold:	9,300	**Population change (%):**	
All-Ireland threshold:	920	5 year:	-9.7
Population size (2011-2016):		12 year:	-52.6
All-Ireland:	92,060	22 year:	-43.4
ROI:	80,707	Historical:	-
Associated with SPA network:	63,123	Average annual change:	-3.5

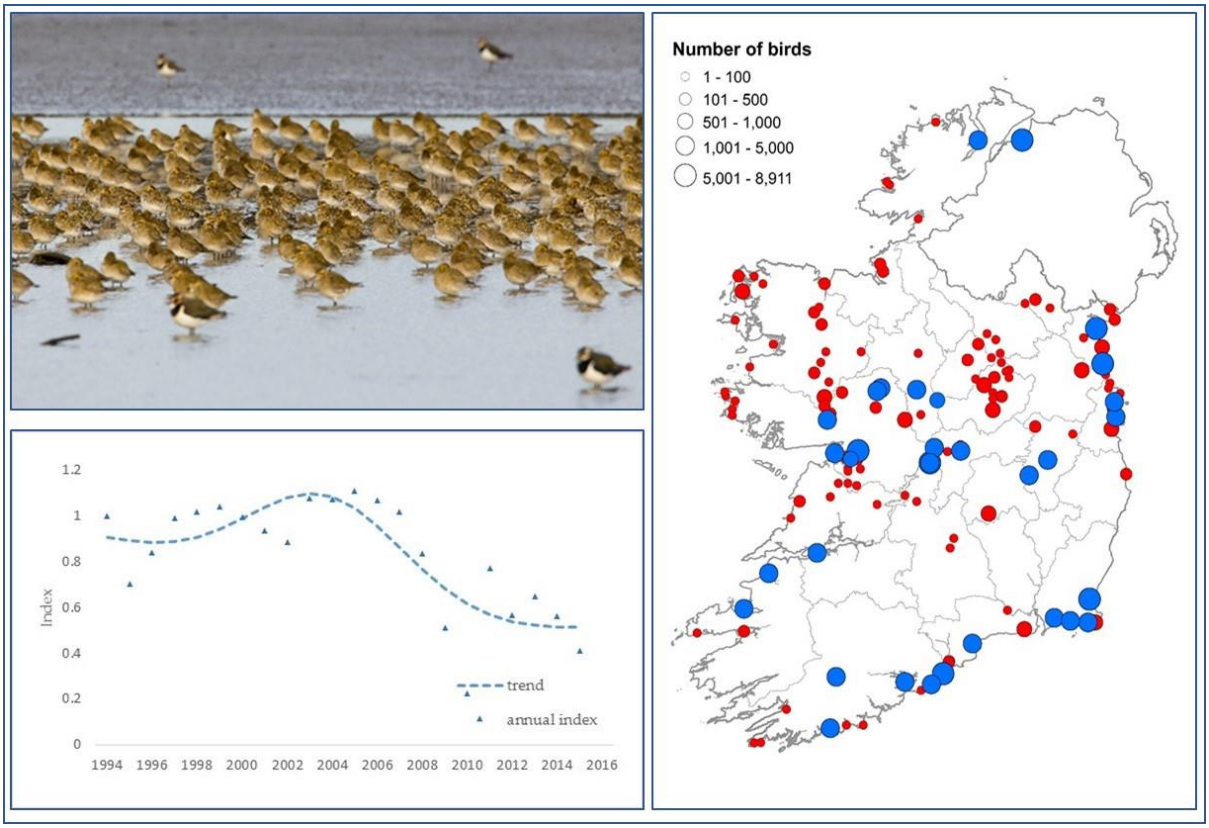


Figure 46 Distribution map and graphed population trend for Golden Plover. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Mark Carmody).

The vast majority of Eurasian Golden Plover (hereafter Golden Plover) that overwinter in Ireland are from the *altifrons* population which breed in Iceland, the Faeroes and Greenland. This population winters in Ireland, Britain, France, Iberia and north-west Africa. It unknown where the *apicaria* population, which breeds in Ireland, migrates to spend winter, but it is likely that a portion of the population remains in the country, with the rest moving south to winter elsewhere (Wernham *et al*., 2002). The flyway population is unclear (Wetlands International, 2018). In Ireland there is a clear trend for decline, particularly since the mid 2000s, while in Britain there is also a ten-year trend for decline (Frost *et al*., 2018). The reason for these declines it not well known. A substantial eastward shift was

noted in the British population suggesting that short-stopping is a possible factor at play (Gillings *et al*., 2006).

Wintering Golden Plover are widely distributed throughout Ireland from coastal regions to the midlands. However, they are much less prevalent on inland sites in the south of Ireland. This species is highly gregarious. Large flocks are known to gather on a range of habitats, primarily on grassland, cultivated lowlands and coastal mudflats.

During the current period Golden Plover were recorded at 138 sites, a decrease from 158 during the former period. Wexford Harbour and Slobs and Dundalk Bay remain the top sites in the country for this species although they no longer support numbers of international importance. In addition to these two top-ranked sites, a further 32 sites were found to hold numbers of national importance including four sites that held significant numbers for the first time since the beginning of the survey.

Table 45 Table showing sites supporting nationally important numbers of Golden Plover ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Wexford Harbour & Slobs [3]	4,800*	1,000*	10,000	4,907	12,350	6,200	11,100	8,911	12,350	Jan
Dundalk Bay [3]	7,235	4,984	8,797	9,060	8,450	5,150	5,685	7,428	9,060	-
Ballymacoda		98*	8,561	3,200		8,400	1*	6,720	8,561	-
Lough Foyle †	5,091	2,366	4,375	7,978	5,462	6,870	6,026	6,142	7,978	
Little Brosna Callows			6,000	3,600	6,300	7,480	2,035*	5,845	7,480	Nov, Jan
Boyne Estuary	537	39	12,213	7,062	3,000	1,100	5,000	5,675	12,213	Dec, Feb
Rahasane Turlough	1,500	3,500	6,000	300*	6,000	4,700	3,500	5,050	6,000	Nov
Shannon Callows [4]	1,680	200	7,610	1,750				4,680	7,610	
Cork Harbour	4,500*	3,357*	5,211	6,900	2,602	3,650	1,970	4,067	6,900	Nov, Dec
Southern Roscommon Lakes	4,000	661	6,261	4,085	4,395	4,052	488	3,856	6,261	Jan
Bannow Bay	3,517		2,073		4,100	6,000	3,000	3,793	6,000	Jan
Derryoughter West [1]							3,500	3,500	3,500	
Kildare Curragh							3,500	3,500	3,500	
Tacumshin Lake	10,250	1,500	8,000	2,500	1,500	1,000	3,000	3,200	8,000	Jan
Inishcarra Reservoirs	3,150	516	1,500	5,075	3,220	750*	2,800	3,149	5,075	Jan
Dungarvan Harbour	8,990	692	15	1,497	3,450	3,250	5,371	2,717	5,371	Jan
Rosscarbery	152	3,400	3,300	1,600	3,700	2,800	1,800	2,640	3,700	Nov, Jan
Glenamaddy Turlough	200	2,500			5,000			2,500	5,000	-
Shannon & Fergus Estuary [4]	270	670	3,150	1,561				2,356	3,150	
Lough Swilly	1,756	1,832	2,765	3,000	1,409	2,358	1,379	2,182	3,000	Nov
Ballycotton Shanagarry	41	1*	141	1,740	3,250	2,880	2,650	2,132	3,250	Dec, Jan
The Cull & Killag (Ballyteige)	530	400	290	400	1,550	4,500	3,500	2,048	4,500	Mar
Lough Corrib	609	3,931	844*	179	6,848	535	420	1,996	6,848	Nov

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Tralee Bay, Lough Gill & Akeragh Lough	2,500	2,300	3,000	3,300		170	2,225	1,739	3,300	-
Baldoyle Bay [1]	672				2,500	450	2,000	1,650	2,500	
Rogerstown Estuary	664	40	530	3,300	130	2,000	2,050	1,602	3,300	Jan
Shannon Callows	500	461	1,650	1,000		1,290	1,000	1,235	1,650	Jan
Cashen River & Estuary [1]			2,000		800*	1,120	360	1,160	2,000	
Inner Galway Bay	247	527	1,612	930	1,441	1,213	412	1,122	1,612	Nov
Little Brosna Callows [4]	2,045		2,200					1,100	2,200	
Lough Ree		205					2,050	1,025	2,050	
Kiltullagh Lough	2,200	3,000		1,700	300			1,000	1,700	-
Kiltiernan Turlough [1]			80	500	2,000	1,420*	1,200	945	2,000	Jan
Sites no longer supporting numbers of national importance										
Tramore Back Strand	100*	350		150	1,000	2,503		913	2,503	Feb
Dublin Bay	1,360	430	390	404	1,080	742	1,155	754	1,155	
Killala Bay	280	570	700	1251	52	338		468	1,251	
Broadmeadow (Malahide) Estuary	72	1,000	260	1,000	200	5		293	1,000	
Braganstown	142			60	6			33	60	
Lough Ree		205					2,050*		0	

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[3]Site demoted (from supporting numbers of international importance to numbers of national importance) since the 2001/02 to 2008/09 period.

[4]Aerial census data.

4.46 Grey Plover *Pluvialis squatarola* Feadóg ghlas

squatarola, Arctic Russia east to Taymyr Peninsula & N. E. Canada (br)

International threshold	2,000	**Population change (%):**	
All-Ireland threshold:	30	5 year:	-42.4
Population size (2011-2016):		12 year:	-40.5
All-Ireland:	2,940	22 year:	-61.8
ROI:	2,812	Historical:	-24.8
Associated with SPA network:	2,550	Average annual change:	-3.6

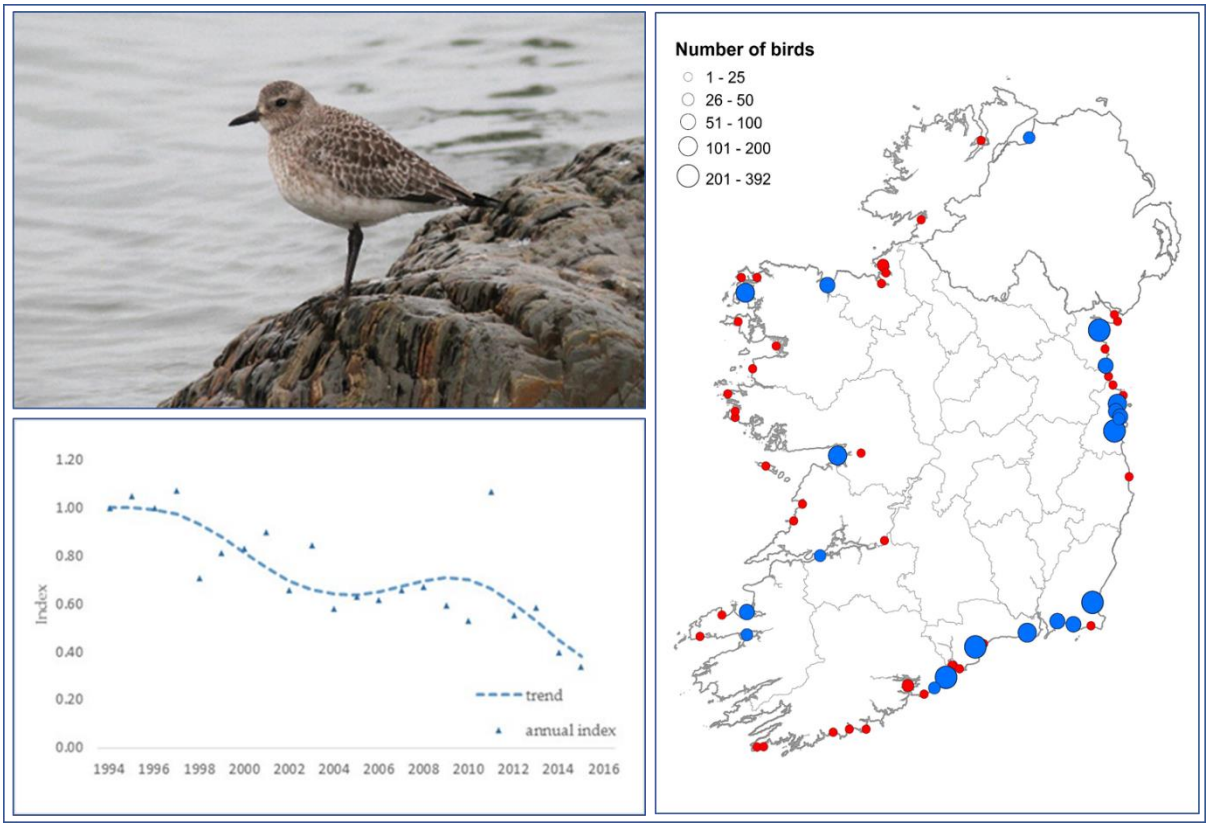


Figure 47 Distribution map and graphed population trend for Grey Plover. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Dick Coombes).

Grey Plover that overwinter in Ireland are of the nominate subspecies *squatarola* which breed across Arctic Russia east to the Taymyr Peninsula & north-east Canada. The non-breeding range extends from the Wadden Sea, Britain and Ireland to south and west Africa (Wetlands International, 2018). The flyway population is in decline (Wetlands International, 2018). In the UK the trend for Grey Plover is stable (Frost *et al*., 2018) while in the Republic of Ireland numbers have undergone a steep decline since the former period with an overall downward trend of -3.6% per annum in the last 22 years.

Grey Plover are distributed predominantly around coastal areas in Ireland. Wintering birds are often solitary at both estuarine and non-estuarine sites. There is also a considerable difference between the

results of the two previous Non-Estuarine Coastal Waterbird Surveys (NEWS). During NEWS III (2015/16), 6.7% of the estimated wintering Grey Plover population was found to be using non-estuarine sites, compared to *c.*20% during NEWS II in 2006/07 (Lewis *et al*., 2017, Crowe *et al*., 2008).

Grey Plover were recorded at 68 sites between the period 2011/12 – 2015/16 and some 21 sites were found to hold numbers of national importance. Of the significant sites, six were newly assigned to the list. However, the 1% national threshold has been revised downwards from 65 to 30 since the former period which will have been a contributing factor in the increased number of sites supporting significant numbers.

Table 46 Table showing sites supporting nationally important numbers of Grey Plover ranked by on the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Wexford Harbour & Slobs	17*	33*	1,000	129	42	261	528	392	1,000	Dec
Dublin Bay	394	293	200	307	310	452	240	302	452	Feb, Mar
Dundalk Bay	284	176	64	340	333	133	289	232	340	Nov, Feb
Ballymacoda	51*	52*	375	61		257	56*	231	375	Feb
Dungarvan Harbour	410	243	189	285	220	173	200	213	285	Feb
Rogerstown Estuary	223	210	371	242	151	120	64	190	371	Sep
Tramore Back Strand	18*	130	168	96	140	145		137	168	Jan
Inner Galway Bay	136	35	68	72	243	136	28	109	243	Mar
Blacksod & Tullaghan Bays [1]	56	17*	122	100	117	111	67	103	122	Feb
Tralee Bay, Lough Gill & Akeragh Lough[1]	14	14	414	4	14	15	52	100	414	Oct, Jan
Killala Bay[1]	2	311	70	124	101	36	139	94	139	Jan
Boyne Estuary	80	31	100	108	50	71	100	86	108	Dec
The Cull & Killag (Ballyteige)	38	66	45	77	96	99	101	84	101	Feb
Bannow Bay [1]	118		72		76	77	25	63	77	Dec, Jan
Hick's Tower & Robswall[1]	176	82	52					52	52	Nov
Broadmeadow (Malahide) Estuary	150	169	3	140	9	6	100	52	140	Jan
Ballycotton Shanagarry	50	3_<	76	53	31	33	22	43	76	Feb
Castlemaine Harbour & Rossbehy [1]		73	96	41	45	30		42	96	Nov, Feb
Shannon & Fergus Estuary [4]	10	10	5	70				38	70	
Baldoyle Bay	166				55	28	8	30	55	Sep
Lough Foyle †	26	22	22	48	32	9	40	30	48	Feb

* Low-quality count not included in the calculation of the mean.
† Data provided by the UK (WeBS).
[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.
[4]Aerial census data.

4.47 Lapwing *Vanellus vanellus* Pilibín

Europe & W. Asia (br)

International threshold:	72,300	**Population change (%):**	
All-Ireland threshold:	850	5 year:	-14.0
Population size (2011-2016):		12 year:	-52.0
All-Ireland:	84,690	22 year:	-67.6
ROI:	69,823	Historical:	-58.4
Associated with SPA network:	48,232	Average annual change:	-5.2

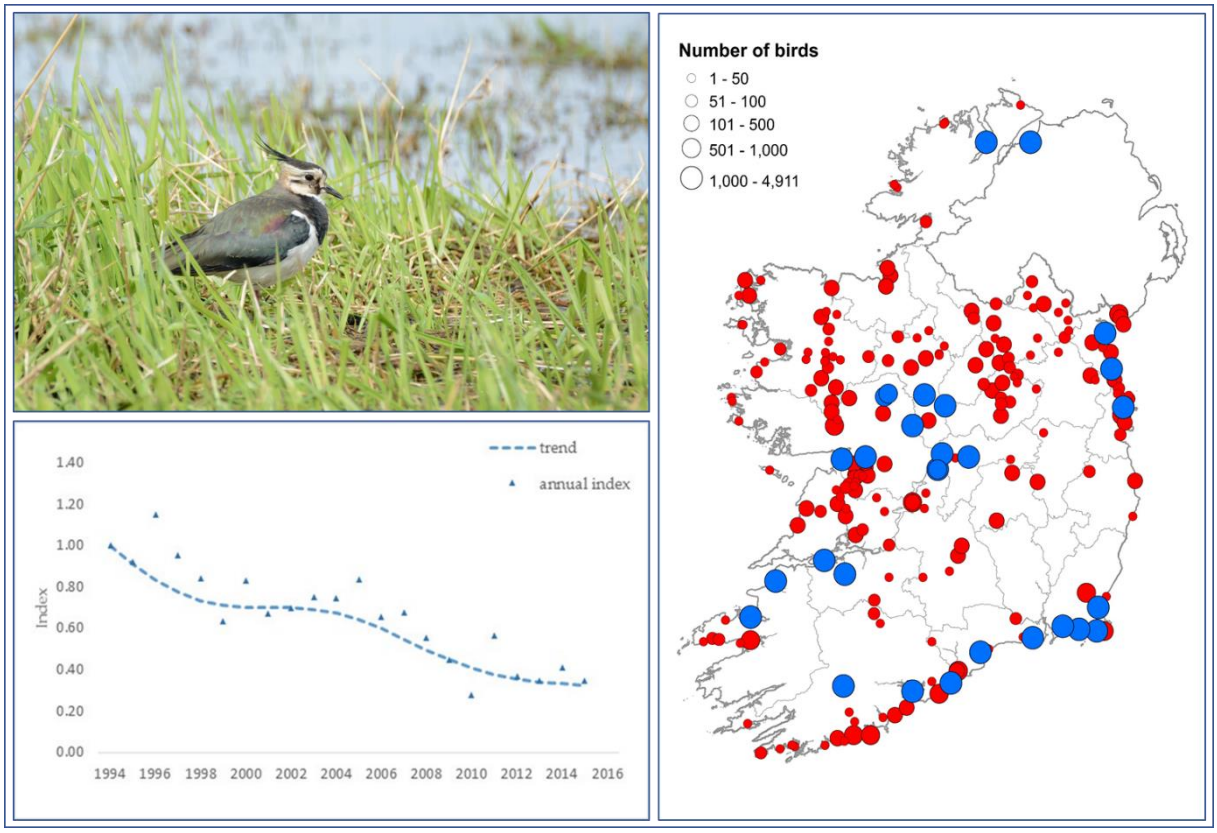


Figure 48 Distribution map and graphed population trend for Lapwing. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Brian Burke).

Wetlands International (2018) now recognises just one population of the Northern Lapwing (hereafter Lapwing) that breeds across Europe and western Asia, and winters across Europe, Asia Minor, north Africa, south-west and central Asia and the Caspian coast. As a consequence, the 1% international threshold has increased from 20,000 to 72,300 since the former period (Boland & Crowe, 2012). This population is in decline (Wetlands International, 2018).

In Ireland, this wader has shown a decline overall throughout I-WeBS; consistent with both Britain and Northern Ireland (Frost *et al.*, 2018). Lapwing are sensitive to severe winters, and movements

westward from northern Europe into Britain and Ireland, and south to France and Iberia during particularly cold periods are known (Wernham *et al*., 2002). Furthermore, a relatively large proportion of Lapwing are known to spend winter away from coastal wetlands, often in non-wetland habitats such as agricultural land. Therefore, this species is considered poorly monitored by wetland waterbird monitoring methods and assigning accurate national estimates of wintering populations is difficult (Delaney *et al*., 2009).

Lapwing were recorded at 226 sites between 2011/12 and 2015/16 with no site supporting numbers of international importance. Some 30 sites supported numbers of national importance including eight sites that were not of significance during the former period. The increase in sites on the former period can be attributed to the decrease in the 1% national threshold from 2,100 to 850, and it is notable that no site supported a five-year mean of greater than 5,000 individuals, a threshold that was exceeded by four sites during the former period. The Shannon Callows (aerial census) was the highest ranked site for the current period although this was based on data from two seasons only.

In particular, numbers at Bannow Bay, the top ranked site for the 2004/05 – 2008/09 period, have declined substantially since the former period. Substantial declines in numbers are also evident at Tralee Bay, Lough Gill & Akeragh Lough, Wexford Harbour & Slobs, Little Brosna Callows, Rogerstown Estuary, The Cull and Killag, and Inner Galway Bay, amongst others.

Table 47 Table showing sites supporting nationally important numbers of Lapwing ranked by on the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Shannon Callows [4]	2,837	1,397	7,672	2,149				4,911	7,672	
Dundalk Bay	5,284	4,073	4,511	4,135	5,506	4,202	2,862	4,243	5,506	Jan
Wexford Harbour & Slobs	3,030*	1,180*	7,667	3,985	2,150	4,815	1,596	4,043	7,667	Jan
Rogerstown Estuary	1,268	710	2,855	5,805	897	2,099	5,185	3,368	5,805	Feb
Shannon & Fergus Estuary [4]	218	799	3,062	3,187				3,125	3,187	
Little Brosna Callows			3,055	1,135	1,978	6,200	3,015*	3,092	6,200	Jan
Lough Swilly	1,879	1,823	2,728	1,681	2,080	3,666	3,229	2,677	3,666	Nov
River Deel [1]				2,600				2,600	2,600	
Lough Foyle †	2,663	1,130	2,459	960	2,616	3,697	2,886	2,524	3,697	
Southern Roscommon Lakes	3,229	614	4,988	1,327	1,819	2,867	331	2,266	4,988	Nov, Jan
Boyne Estuary [1]	1,775	670	4,750	658	1,200	1,757	1,354	1,944	4,750	Jan, Feb
Cork Harbour	1,974*	2,715*	2,217	1,934	1,750	1,942	1,740	1,917	2,217	Dec
Inner Galway Bay	1,023	1,336	2,385	909	2,041	1,947	1,629	1,782	2,385	Jan
Rahasane Turlough	300	570	3,500	330	2,600	400	2,000	1,766	3,500	Nov

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Inishcarra Reservoirs	1,800	384	480	2,727	1,806	269*	1,870	1,721	2,727	Dec
Tacumshin Lake	4,150	1,800	4,180		900	2,000	1,020	1,620	4,180	Jan
Cashen River & Estuary [1]			3,000		602*	847	960	1,602	3,000	Jan
The Cull & Killag (Ballyteige)	2,180	245	910	685	2,062	2,120	1,602	1,476	2,120	Nov
River Suck [4]	3,442	1,811	1,050	1,767				1,409	1,767	
Dungarvan Harbour	1,768	1,564	829	751	2,414	1,322	1,368	1,337	2,414	Feb
Tralee Bay, Lough Gill & Akeragh Lough	2,297	3,458	2,835	2,996	139	469	238	1,335	2,996	Jan
Bannow Bay	3,401		1,845		2,450	974		1,317	2,450	Nov, Dec, Jan
Ballymacoda [1]	11*	4*	1,465	747		1,239	53*	1,150	1,465	
Lough Ree		1,443					1,150	1,150	1,150	
Boora Lakes – Back Lakes Finnamores [1]	249*				705		1,570	1,138	1,570	
Shannon Callows	963	327	1,550	863		1,778	120	1,078	1,778	Nov
Tramore Back Strand [1]		715	15	1,205	1,270	1,629		1,030	1,629	Jan
Little Brosna Callows [4]	1,110	570	1,150	800				975	1,150	Jan
Kiltullagh Lough [1]	1,710	5,500		1,850	32			941	1,850	
Glenamaddy Turlough [1]	650	445			1,800			900	1,800	
Sites no longer supporting numbers of national importance										
River Suck						1,400	284*	842	1,400	

Sites that supported numbers of national importance in the former period but no data were available for the current period: Cahore Marshes.

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS)

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[4]Aerial census data.

4.48 Knot *Calidris canutus* Cnota

islandica, N.E. Canada & Greenland (br)

International threshold:	5,300	**Population change (%):**	
All-Ireland threshold:	160	5 year:	-48.5
Population size (2011-2016):		12 year:	-32.2
All-Ireland:	16,270	22 year:	-39.7
ROI:	13,752	Historical:	-30.3
Associated with SPA network:	12,831	Average annual change:	-0.4

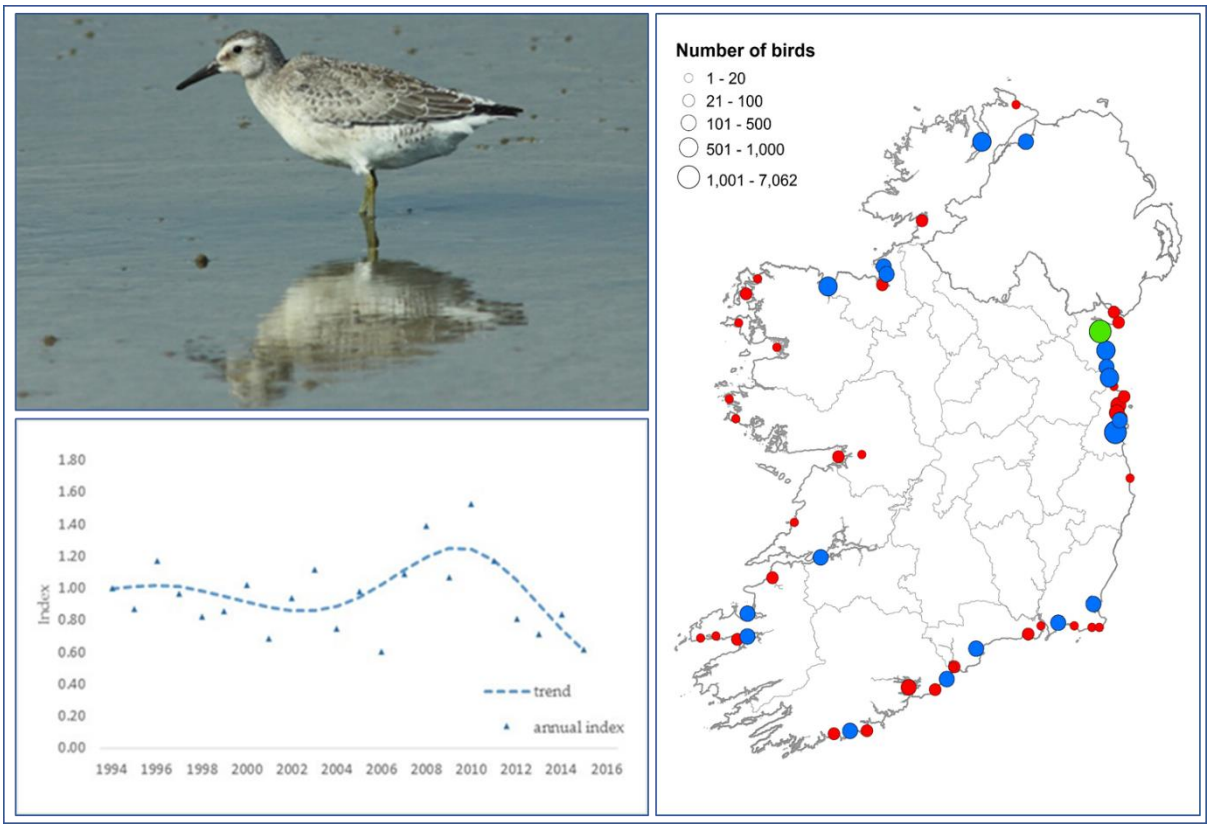


Figure 49 Distribution map and graphed population trend for Knot. The distribution map illustrates sites supporting numbers of international importance (green circles), national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Dick Coombes).

The Red Knot (hereafter Knot) that winter in Ireland and Britain are predominately of the *islandica* population. This population breeds in the islands of high Arctic Canada and Greenland, and spends winter in western Europe, particularly the Wadden Sea, Britain and Ireland. At flyway level, the *islandica* population has fluctuated since the early 1990s (Wetlands International, 2018) but is relatively stable, while in both Ireland and Britain, long-term trends for decline are evident.

Knot migrate and winter in large flocks which occur exclusively at coastal sites as their preference is for sandy beaches and tidal mud- or sand-flats (van Roomen *et al*, 2015). The highest concentrations

are found at estuarine sites along the south and east coasts. During the current period, Knot were found at 55 sites around the coast. Dundalk Bay retains its top-ranking position and is the only site to support numbers of international importance. Dublin Bay continues to hold high numbers but a decline in numbers since the former period means that it is now the highest ranked site that supports numbers of national importance. A total of 18 sites were found to support Knot in numbers of national importance, six of which did not qualify in the former period. At five sites, including Rogerstown Estuary and Broadmeadow (Malahide) Estuary, numbers declined below the threshold.

Table 48 Table showing sites supporting internationally and/ or nationally important numbers of Knot ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of international importance										
Dundalk Bay	13,855	14,692	12,837	3,900	6,578	6,460	5,535	7,062	12,837	Jan
Sites supporting numbers of national importance										
Dublin Bay [3]	4,105	2,799	3,435	3,022	4,547	4,950	2,495	3,690	4,950	Dec
Killala Bay	6	446	726	3,260	336	537	54	983	3,260	Feb
Nanny Estuary & shore	4,042	1,500	1,800	1,400	212	1*	660	814	1,800	Dec, Feb
Lough Swilly	1,982	1,402	1,250	895	293	751	866	811	1,250	Nov
Dunany Point – Clogher Head	397	2,790	1,410	810			350	643	1,410	Nov, Feb, Mar
Dungarvan Harbour	729	551	370	604	203	689	540	481	689	Feb
Boyne Estuary	1,700	1,500	855	1,000	26	18	300	440	1,000	
Drumcliff Bay Estuary	696	268	328	162	535	227	227	296	535	Jan
Lough Foyle †	38	350	218	239	243	306	290	259	306	
Wexford Harbour & Slobs [1]		11*	261	48	851	11	71	248	851	
Castlemaine Harbour & Rossbehy [1]	273*	409	322	342	41	244	276	245	342	Oct, Jan
Sligo Harbour	950	521	130	250	260	111	278	206	278	
Tralee Bay, Lough Gill & Akeragh Lough	28	481	398	272	38	290	25	205	398	Jan
Shannon & Fergus Estuary [4 1]				200				200	200	
Baldoyle Bay [1]	112				553		19	191	553	Oct, Jan
Clonakilty Bay [1]	628	834	409	271	42	150	44	183	409	Jan
Bannow Bay	329		170		120	280	120	173	280	Dec
Ballymacoda [1]	21*	44*	313	79		101	29*	164	313	Sep
Sites no longer supporting numbers of national importance										
Rogerstown Estuary	501	88	190	256	30	130	89	139	256	Feb

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Broadmeadow (Malahide) Estuary	354	870	4	440	110	49	9	122	440	Oct
Blacksod & Tullaghan Bays	187	30*	108	82	93	86	106	95	108	Jan
Courtmacsherry Bay, Broadstrand Bay & Dunworley	105	54	17	35	140	42	9	49	140	Dec, Feb
Delvin River – Hampton Cove				8				2	8	Feb

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

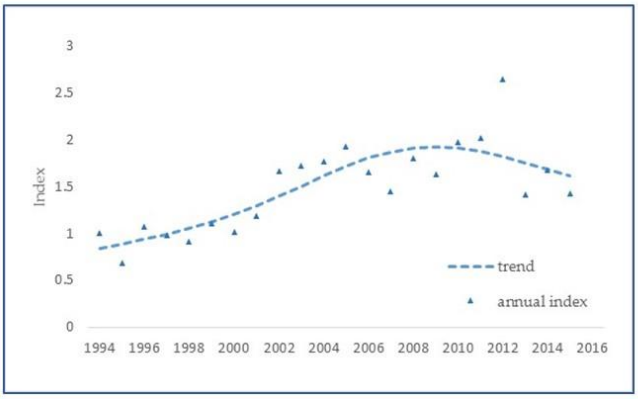
[3]Site demoted (from supporting numbers of international importance to numbers of national importance) since the 2001/02 to 2008/09 period.

[4]Aerial census data.

4.49 Sanderling *Calidris alba* Luathrán

alba N.E. Canada, N. & N.E. Greenland, Svalbard, W. Taymyr (br)

International threshold:	2,000	**Population change (%):**	
All-Ireland threshold:	85	5 year:	-14.1
Population size (2011-2016):		12 year:	-0.1
All-Ireland:	8,420	22 year:	+91.8
ROI:	7,572	Historical:	+234.4
Associated with ROI SPA network:	3,169	Average annual change:	+3.9



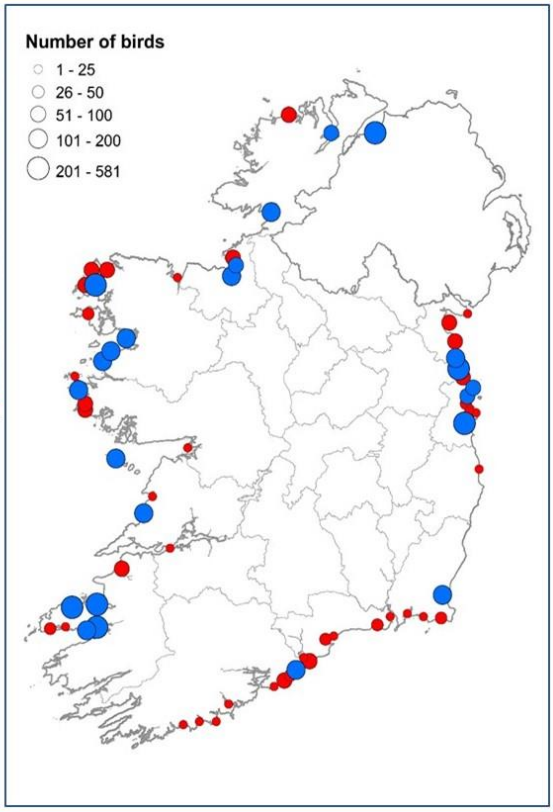


Figure 50 Distribution map and graphed population trend for Sanderling. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Dick Coombes).

The Sanderling is a long-distance migratory wading bird that occurs in Ireland during winter but also on passage in March, August and September. Sanderling occurring in Ireland are of the nominate subspecies *C. a. alba* which breed across north-east Canada, north and north-east Greenland, Svalbard and western Taymyr (Wetlands International, 2018). At a flyway level, this population is stable (Wetlands International, 2018).

It was once believed that Sanderling wintering in Britain & Ireland originated solely from Siberia (Wernham *et al.*, 2002). However, colour-marking studies have revealed that Greenland-breeding birds, which occur here during passage, also overwinter here. The *alba* population winters along the

East Atlantic Flyway (Atlantic coast of Europe and Africa) in addition to the African east coast plus West and central Asia (Reneerkens *et al*., 2009).

In Ireland, Sanderling numbers have continued to increase since the former period with an annual increase of 3.9%. This trend is also reflected in Northern Ireland and Britain (Frost *et al*., 2018). The reasons for the increasing flyway population are not well understood. The High Arctic breeding range of Sanderling makes studies of their breeding biology difficult (Reneerkens *et al*., 2009), so aspects of their breeding system and links between the breeding and non-breeding grounds of different populations are not well established (Wernham *et al*., 2002). However, a current project of the International Wader Study Group (www.waderstudygroup.org/projects/sanderling-project/) is using data gathered by a network of volunteers on the age ratios of migrating and wintering Sanderling at different sites and at different times throughout the European wintering range of the species. These age ratios currently are the only reliable estimate of the annual reproductive success at the population level which, over the years, will help to create a clearer picture of how migration and recruitment of juvenile Sanderling varies along the East Atlantic Flyway and to which extent annual reproductive success contributes to the growth of the Sanderling population.

Wintering populations of Sanderling occur primarily in coastal areas, often on sandy beaches. In Ireland, many open sandy shorelines are not well covered by I-WeBS and so many of the important sites for this wader, as identified by other surveys, do not feature in this report. For instance, the 2015/16 Non-Estuarine Coastal Waterbird Survey (NEWS-III) found that a significant proportion of Ireland's estimated population of Sanderling can occur along the open coast, non-estuarine coast (Lewis *et al*., 2017).

Sanderling were recorded at 67 sites between 2011/12 – 2015/16. This is an increase of five sites since the former period. A total of 23 sites supported numbers of national importance. The sandy beaches of Tralee Bay, Lough Gill & Akeragh Lough continue to rank as the top site for Sanderling. Blacksod & Tullaghan Bays has seen a noteworthy increase in Sanderling and is now the second most important site for these birds. Numbers at seven sites have now declined below the threshold and no longer hold significant numbers (Table 49).

Table 49 Table showing sites supporting nationally important numbers of Sanderling ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Tralee Bay, Lough Gill & Akeragh Lough	586	590	1296	1058	800	581	520	851	1,296	Jan, Mar
Blacksod & Tullaghan Bays	228	445*	333	944	328	331	711	529	944	Oct
Dublin Bay	674	300	411	405	510	266	841	487	841	Oct
Castlemaine Harbour & Rossbehy	452*	505	400	727	350	300		444	727	Feb
Lough Foyle †	488	518	673	379	300	148	650	430	673	
Nanny Estuary & shore	421	246	104*	259*	350	300	339	330	350	Sep, Oct
Brandon Bay – Inner Brandon Bay			444	270	243			319	444	Jan
Ballysadare Bay	192	62	140	668		58	110	195	668	
Ballymacoda	84*	114*	194	195		185	49*	191	195	Nov

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Castlemaine Outer: Inch offshore [1]		441	350	204				185	350	
Clew Bay	66	79	148	450		84	125	161	450	Jan
Mid-Clare Coast (Mal Bay – Doonbeg Bay)	178	70		250	32*	118	270	160	270	
South Mayo Coast	144	264	128	250	178	171	60	157	250	Nov
Boyne Estuary	100	251	230	192	150	100	100	154	230	
Omey Strand [1]	66	114	121*	140	231	97	132	150	231	Oct
Donegal Bay	57	205	85	254	123	69	169	140	254	Feb
Inishmore, Aran Islands[1]	80	49	180	67	190	96	99	126	190	Jan
Wexford Harbour & Slobs [1]		3*	182	106	61	130	123	120	182	Jan, Feb
Carrowmore Beach [1]	40	68	103	92	96	167		115	167	
Lough Swilly [1]	9	45	77	95	26	226	66	98	226	Feb
Rogerstown Estuary [1]	30	6	20	300	31	1	130	96	300	Jan
Sligo Harbour		1	93	75	102	64	133	93	133	Nov
Skerries Coast [1]	20*	52	66	64	120	90	113	91	120	Feb
Sites no longer supporting numbers of national importance										
Termoncarragh & Annagh Marsh	94	127	115	76	102	27		80	115	Oct, Nov
Ballycotton Shanagarry	131	1*	44	71	76	92	108	78	108	Dec, Feb
Mannin Bay	77	72	131	45	85	70	58	78	131	Oct
Mullet West	70	42*	71	52	76	95		74	95	Nov
Dunany Point – Clogher Head	110	177	155	16	27*		20	64	155	
Dungarvan Harbour	75	12	41		23	59	94	54	94	Feb
Inishbofin	56	65	10					10	10	

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

4.50 Curlew Sandpiper *Calidris ferruginea* Gobadán crotaigh

C. & W. Siberia (br)

Passage migrant

International threshold: 4,000

Mean/ Peak (2011/12 – 2015/16): 22/65

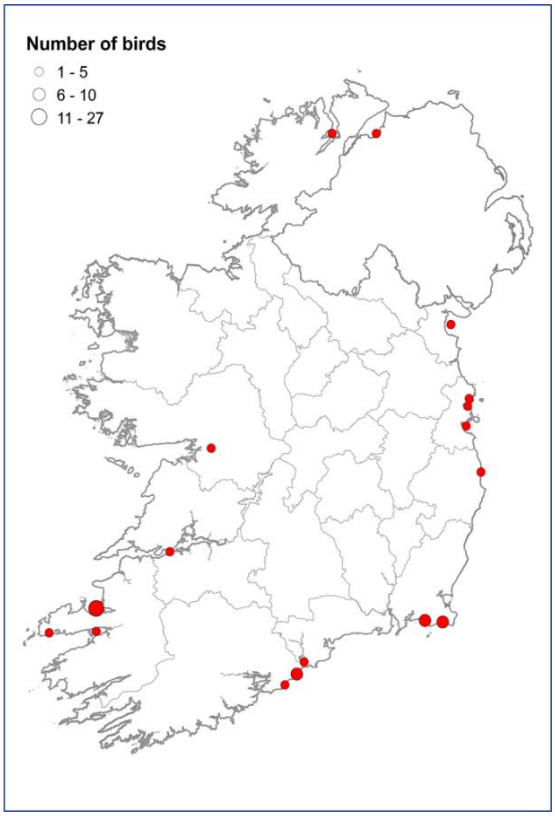


Figure 51 Distribution map for Curlew Sandpiper showing peak counts (2011/12 – 2015/16) (Photo: Dick Coombes).

Wetlands International recognises two populations of Curlew Sandpiper; one that breeds in central and western Siberia and winters in south-west Asia and east and south Africa, and one that breeds in western Siberia and winters in west Africa. Both populations are in decline.

Curlew Sandpiper occur as passage migrants in Ireland and small numbers are recorded mostly during autumn passage, in September and October. They were recorded at 17 sites during the current period with a peak of 27 birds recorded at Tralee Bay, Lough Gill & Akeragh Lough in 2011/12.

Table 50 Table showing sites that supported Curlew Sandpiper in five or more seasons between 2009/10 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15
Tacumshin Lake			7	9	7	1	1	5	9
Lough Swilly	1	8	3			4	2	2	4

Other sites recorded in less than five seasons (peak count 2011/12 – 2015/16):

Ballycotton Shanagarry (1), Ballymacoda (9), Blackwater Estuary (1), Broadmeadow (Malahide) Estuary (2), Castlemaine Harbour & Rossbehy (4), Dublin Bay (1), Dundalk Bay (5), Lough Foyle (NI) (5), North Wicklow Coastal Marshes (1), Rahasane Turlough (1), Rogerstown Estuary (4), Shannon & Fergus Estuary (2), The Cull & Killag (Ballyteige) (6), Tralee Bay, Lough Gill & Akeragh Lough (27), Ventry Harbour (1).

4.51 Purple Sandpiper *Calidris maritima* Gobadán cosbhuí

maritima, N. Europe & W. Siberia (br)[1]

maritima, N.E. Canada & Greenland (br)[2]

International threshold:	710[1]/110[2]	**Population change (%):**	
All-Ireland threshold:	20	5 year:	-35.6
Population size (2011-2016):		12 year:	-63.1
All-Ireland:	660	22 year:	-60.6
ROI:	465	Historical:	-57.8
Associated with ROI SPA network:	82	Average annual change:	-5.6

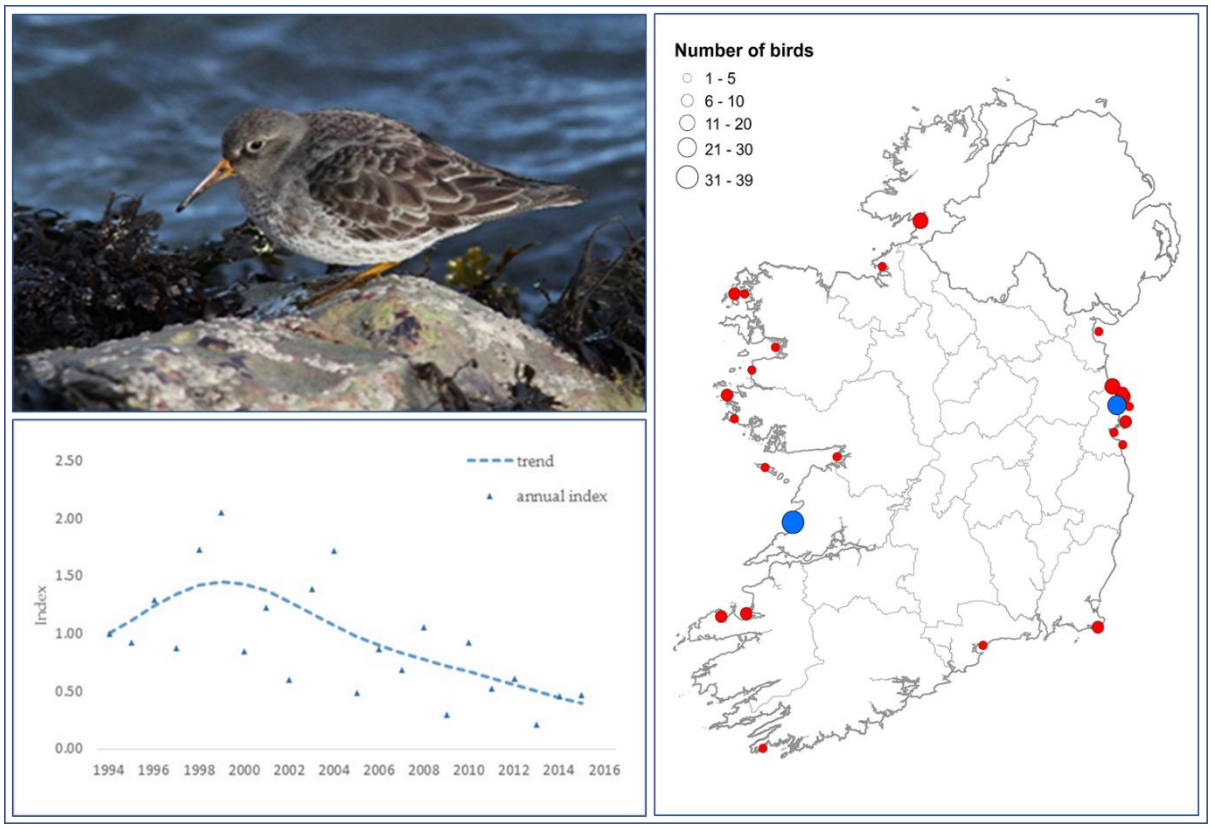


Figure 52 Distribution map and graphed population trend for Purple Sandpiper. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Dick Coombes).

The breeding range of Purple Sandpiper extends across the western part of the Arctic, from northeast Canada, eastward to Greenland, Iceland, Svalbard, Scandinavia, and the Taymyr Peninsula (Delaney *et al*., 2009). Wetlands International (2018) recognises two populations of Purple Sandpiper; one breeding across northern Europe and western Siberia, and one breeding across north-east Canada and Greenland. These populations have increasing and decreasing trends respectively (Wetlands International, 2018).

It is possible to assign birds to breeding origins based on bill lengths (Nicoll *et al*., 1988). A long-billed population is thought to originate from Canada or east Greenland, while a short-billed population originates from southern Norway (Nicoll *et al*., 1988; Summers *et al*., 1992; Summers, 1994). While it was thought likely that birds wintering in Ireland were of Canadian origin, early evidence of this was provided in 2010 when researchers assessed biometrics of birds caught in County Clare. This research indicated that at least part of the Irish wintering population belongs to the long-winged, long-billed population which also winter in Scotland, occur in Iceland on stopover, and likely originate from Canadian breeding stock (Foster *et al*., 2010). It has since been confirmed using data from geolocators (fitted to birds at the same site in Clare) that these Purple Sandpiper migrate from Canada, using Greenland and/ or Iceland as a migratory stopover, and, in some cases, even making non-stop journeys to Ireland from Canada in under three days (Summers *et al*, 2014).

In Ireland, numbers appear to have declined since the early 2000s, while a long-term trend for decline is also evident in the UK (Frost *et al*., 2018). However, caution is advised when interpreting trends for this species because they show a preference for rocky shores (often in remote areas), and are consequently poorly monitored by I-WeBS core count methodology alone. Indeed, Lewis *et al*. (2017) estimated up to 78% of the wintering Purple Sandpiper population use non-estuarine coast, and that there was an increase in both numbers (% change) and distribution (% change) between the non-estuarine surveys of 2006/07 and 2015/16 (Crowe *et al*., 2012a; Lewis *et al*., 2017 respectively) further reducing our confidence in the trends.

Purple Sandpiper were recorded at 25 sites during the current period (2011/12 – 2015/16) and two sites supported numbers of national importance (Table 51). Mid Clare Coast (Mal Bay - Doonbeg Bay) remains the highest ranked site, while Rogerstown Estuary has been promoted since the former period.

Table 51 Table showing sites supporting nationally important numbers of Purple Sandpiper ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Mid-Clare Coast (Mal Bay – Doonbeg Bay)	67		1	86		23	84	39	86	
Rogerstown Estuary [1]	76	5	6	3	72	32	4	23	72	Feb, Mar
Other sites supporting peak counts on one or more occasion that exceeded the threshold for national importance										
Tralee Bay, Lough Gill & Akeragh Lough	57		37					7	37	Jan
Skerries Coast		13	29	6	5	3	28	14	28	Nov
Delvin River – Hampton Cove				26	16	3	10	14	26	Dec
Donegal Bay	8	42	7	25	3	24	5	13	25	Jan
Rossadilisk	8			23	5	4		3	26	

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

4.52 Dunlin *Calidris alpina* Breacóg

alpina, N. Scandinavia, N. Russia, N.W. Siberia (br)

International threshold:	13,300	**Population change (%):**	
All-Ireland threshold:	460	5 year:	-23.0
Population size (2011-2016):		12 year:	-41.7
All-Ireland:	45,760	22 year:	-63.0
ROI:	37,409	Historical:	-52.1
Associated with ROI SPA network:	30,836	Average annual change:	-4.8

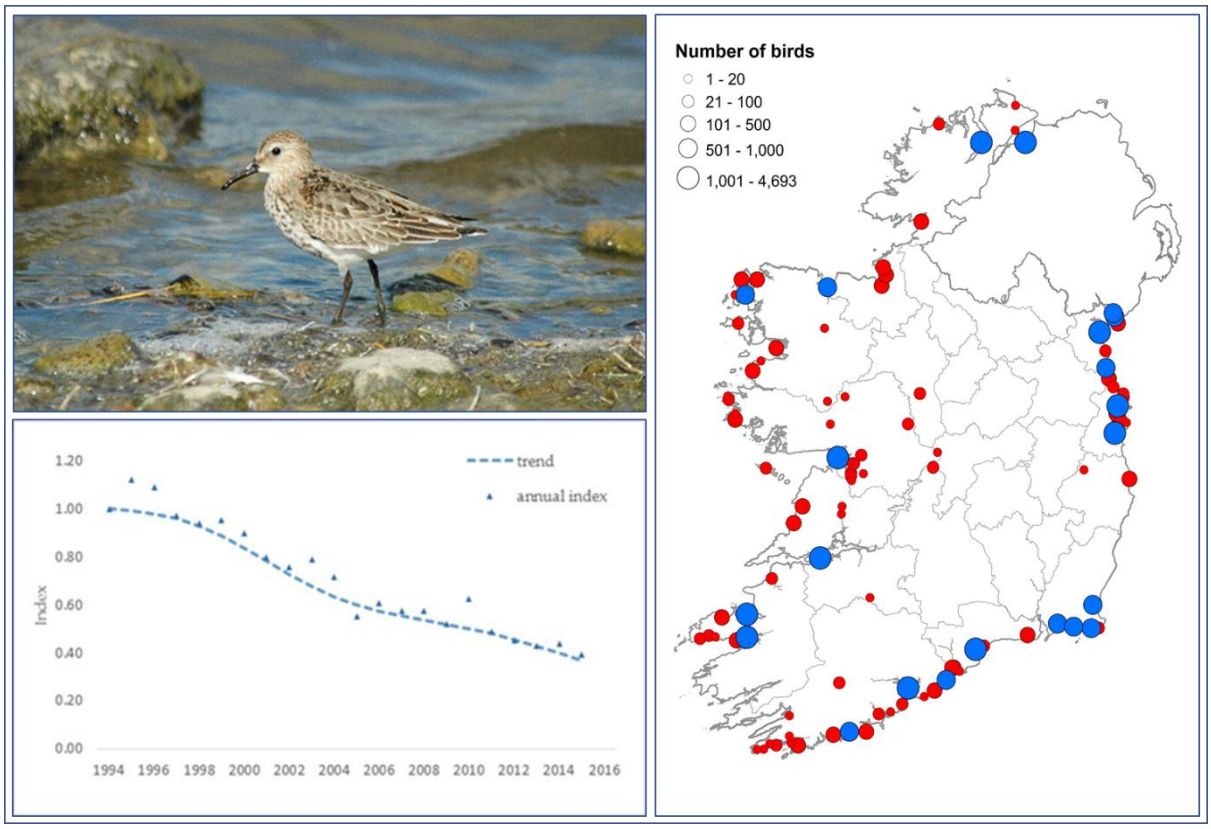


Figure 53 Distribution map and graphed population trend for Dunlin. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Brian Burke).

The Dunlin that winter in Ireland are primarily of the *alpina* population which breed in northern Scandinavia, northern Russia and north-western Siberia. This subspecies winters in western Europe, the Mediterranean and northern and western Africa (Wetlands International, 2018). The *schinzii* population breeds in Ireland and Britain but winters in north-western Africa and south-western Europe. During spring and autumn passage, the subspecies *arctica*, which breeds in north east Greenland, also occurs in Ireland in unknown proportions *en route* to wintering grounds in Africa.

Currently, the flyway population of the *alpina* population is considered stable but has shown a slight short-term decline (Wetlands International, 2018). In Britain and Northern Ireland, the population has undergone long-term declines (Frost *et al*., 2018). Similarly, in Ireland the population has continued to decline since the last reporting period (Crowe & Holt, 2013).

Wintering Dunlin occur primarily around Ireland's coast but can also be found in small numbers at a few inland sites. Dunlin were recorded at 105 sites during the current period. Of these, 22 sites supported numbers of national importance (including both ROI and NI sections of the cross-border site Carlingford Lough). The increase in the list of significant sites, from 15 during the former period (Boland & Crowe, 2012) to the current 22 sites is likely a result of the 1% threshold having decreased markedy since the former period.

Table 52 Table showing sites supporting nationally important numbers of Dunlin ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Lough Swilly	4,714	5,577	4,178	3,243	4,428	5,286	6,330	4,693	6,330	Jan, Feb
Cork Harbour	2,632*	5,037*	4,939	6,789	3,117	3,801	2,934	4,316	6,789	Feb
Dublin Bay	4,270	6,490	3,559	4,163	5,907	3,603	3,376	4,122	5,907	Feb
Dundalk Bay	2,678	3,221	2,030	4,063	3,989	3,086	3,662	3,366	4,063	Nov
Lough Foyle †	1,183	1,515	1,650	1,597	2,511	2,701	1,890	2,070	2,701	
Rogerstown Estuary	3,151	1,061	1,904	1,860	581	2,264	3,469	2,016	3,469	Feb
Dungarvan Harbour	3,150	1,381	1,125	1,786	2,506	2,232	1,402	1,810	2,506	Feb
Inner Galway Bay	1,409	1,675	640	987	1,894	1,732	1,639	1,378	1,894	Jan
Shannon & Fergus Estuary [4]	2,782	2,853	1,330	1,030				1,180	1,330	Oct
Castlemaine Harbour & Rossbehy [1]	411*	1,424	3,499	471	485	636	400	1,098	3,499	Oct
Tralee Bay, Lough Gill & Akeragh Lough [1]	593	962	1,411	1,136	1,500	386	887	1,064	1,500	Jan
Blacksod & Tullaghan Bays [1]	513	361*	1,214	972	1,533	592	541	970	1,533	Nov
Bannow Bay [1]	1238		728		830	1,150	670	845	1,150	Jan
Ballymacoda	88*	868*	958	369		1,089	213*	805	1,089	Sep, Feb
Killala Bay [1]	65	440	624	870	656	1,219	481	770	1,219	Jan
Clonakilty Bay	953	1081	916	586	880	552	651	717	916	Nov
Carlingford Lough (RoI)			120				1,250	685	1,250	
Wexford Harbour & Slobs [1]	30*	800*	1548	501	185	332	760	665	1,548	Oct
Tacumshin Lake [1]	1,425	240	800	500	1,110	100	800	662	1,110	Sep, Mar
Boyne Estuary [1]	470	1477	739	572	535	617	720	637	739	Jan, Feb
Carlingford Lough †	1,370	2,210	1,159	561	351	461	406	588	1,159	
The Cull & Killag (Ballyteige) [1]	605	304	650	470	476	556	508	532	650	Sep

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites no longer supporting numbers of national importance										
Ballysadare Bay	1200	1218	648	205	234	445	650	436	650	Jan
Courtmacsherry Bay, Broadstrand Bay & Dunworley	999	1183	691	128	200	291	448	352	691	Dec
Sligo Harbour	662	434	145	528	152	483	413	344	528	Nov

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[4]Aerial census data.

4.53 Ruff *Calidris pugnax* Rufachán

N. & C. Europe, N.W. Russia, W. & C. Siberia (br)

Scarce winter visitor and passage migrant

International threshold: 22,000

Mean/ Peak (2011/12 – 2015/16): 62/121

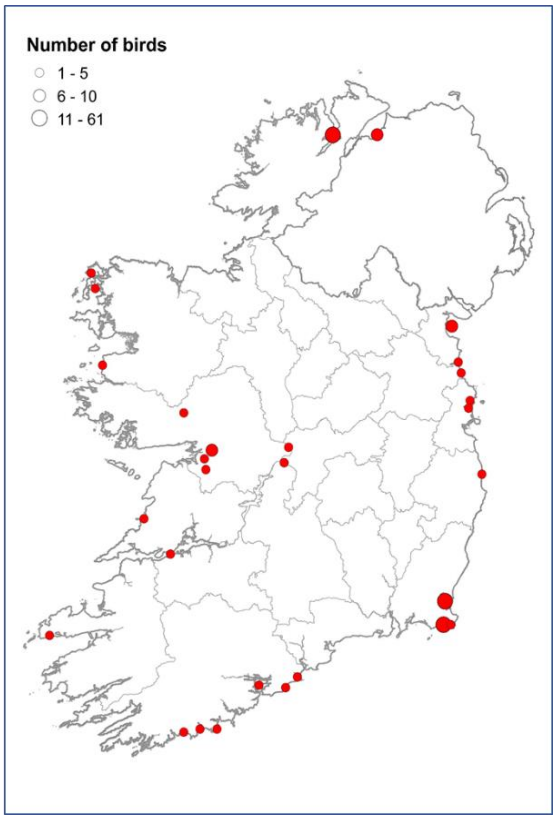


Figure 54 Distribution map for Ruff showing peak counts (2011/12 – 2015/16) (Photo: Dick Coombes).

Two populations of Ruff are recognised in western Eurasia and Africa (Wetlands International, 2018). The population that breeds in north and central Europe and western Siberia, and winters in West Africa is known to be in decline (Wetlands International, 2018; Zöckler, 2002). Small numbers of Ruff occur in Ireland both on passage and throughout the winter period. This species was recorded at 29 sites between 2011/12 and 2015/16 and most regularly at six sites (Table 53).

Table 53 Table showing sites that supported Ruff in five or more seasons between 2009/10 and 2015/16 with the peak count recorded between 2011/12 – 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15
Tacumshin Lake	3				10	7	61	16	61
Wexford Harbour & Slobs	7	9	25	7	7	8	9	11	25
Lough Swilly	7	7	5		3	10	22	8	22
Rahasane Turlough	2	8	9	3	3	2	7	5	9
Dundalk Bay	3	2			8	3	7	4	8
Site	**09/10**	**10/11**	**11/12**	**12/13**	**13/14**	**14/15**	**15/16**	**Mean 11-15**	**Peak 11-15**
Broadmeadow (Malahide) Estuary	4	1	4	1	2	5		2	5

Other sites recorded in less than five seasons (peak count 2011/12 – 2015/16):

Ballycotton Shanagarry (1), Ballymacoda (3), Blacksod & Tullaghan Bays (1), Boyne Estuary (1), Clonakilty Bay (3), Cork Harbour (1), Courtmacsherry Bay, Broadstrand Bay & Dunworley (3), Doolough Headford (Turloughcor) (3), Kiltiernan Turlough (4), Lady's Island Lake (1), Little Brosna Callows (5), Lough Foyle (NI) (6), Lydacan Castle Turlough (1), Mid-Clare Coast (Mal Bay - Doonbeg Bay) (3), Nanny Estuary & shore (1), North Wicklow Coastal Marshes (2), Rogerstown Estuary (2), Rosscarbery (2), Shannon & Fergus Estuary (1), Shannon Callows (1), South Mayo Coast (2), Termoncarragh & Annagh Marsh (1), Ventry Harbour (1).

4.54 Jack Snipe *Lymnocryptes minimus* Naoscach bhídeach

Europe (br)

International threshold: 20,000

Mean/ Peak (2011/12 – 2015/16): 7/11

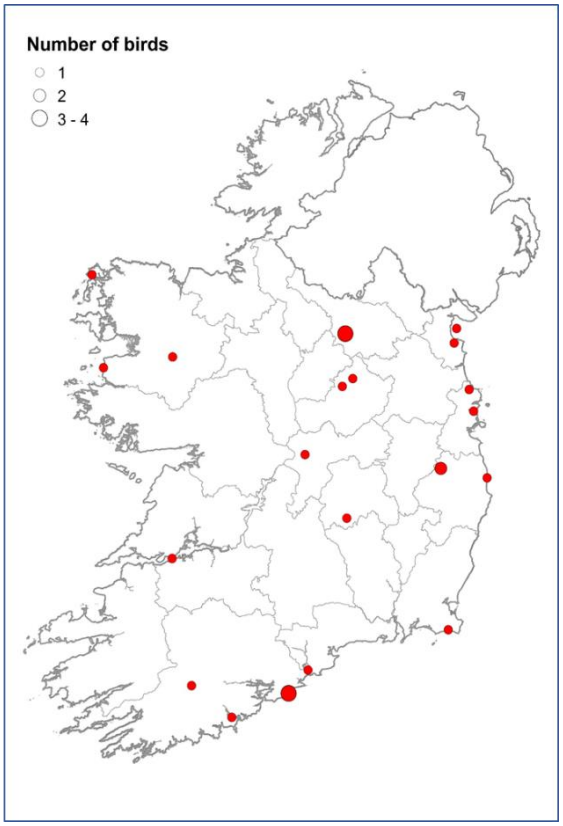


Figure 55 Distribution map for Jack Snipe showing peak counts (2011/12 – 2015/16) (Photo: Niall T. Keogh).

Jack Snipe are a winter visitor and passage migrant to Ireland and Britain. Wetlands International (2018) recognise two populations of Jack Snipe; a population breeding in northern Europe and wintering mainly in southern and western Europe and west Africa, and a population breeding in western Siberia, and wintering mainly in south-west Asia and north-east Africa (Delaney *et al*., 2009). The status of these populations is poorly understood, mainly because this species is secretive, difficult to detect, and difficult to monitor accurately. Jack Snipe are smaller than Snipe, secretive, and tend to crouch down when approached, only flying when in very close proximity. Similarly, the species is difficult to monitor in Ireland via core count methodology alone and we therefore have no reliable data on population size.

Jack Snipe were recorded at 20 sites between 2011/12 and 2015/16, and most regularly at two sites (Table 54). The vast majority of records were of single individuals, the peak count being four individuals at River Erne: Oughter – Gowna in 2013/14.

Table 54 Table showing sites that supported Jack Snipe in five or more seasons between 2009/10 and 2015/16 with the peak count recorded between 2011/12 – 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15
Ballycotton Shanagarry	2	1	1	2	3	2	1	2	3
Shannon & Fergus Estuary		2	1	1	1	1		1	1

Other sites recorded in less than five seasons (peak count 2011/12-2015/16):

Bandon Estuary (1), Blackwater Estuary (1), Broadmeadow (Malahide) Estuary (1), Cloghanhill (1), Dundalk Bay (1), Durrow Curragh (River Erkina) (1), Inishcarra Reservoirs (1), Keenan's Cross Pond (1), Knock Lake (1), Lough Derravaragh (1), Lough Iron (1), North Wicklow Coastal Marshes (1), Poulaphouca Reservoir (2), River Erne: Oughter – Gowna (4), South Mayo Coast (1), Tacumshin Lake (1), Termoncarragh & Annagh Marsh (2), Wetland near Drumcarrabaun (Belcarra/Ballyglass Road) (3).

4.55 Snipe *Gallinago gallinago* Naoscach

gallinago Europe (br)

faeroeensis Iceland, Faroe Islands, Shetland and Orkney Islands (br)

International threshold: 100,000

Mean/ Peak (2011/12 – 2015/16): 784/883

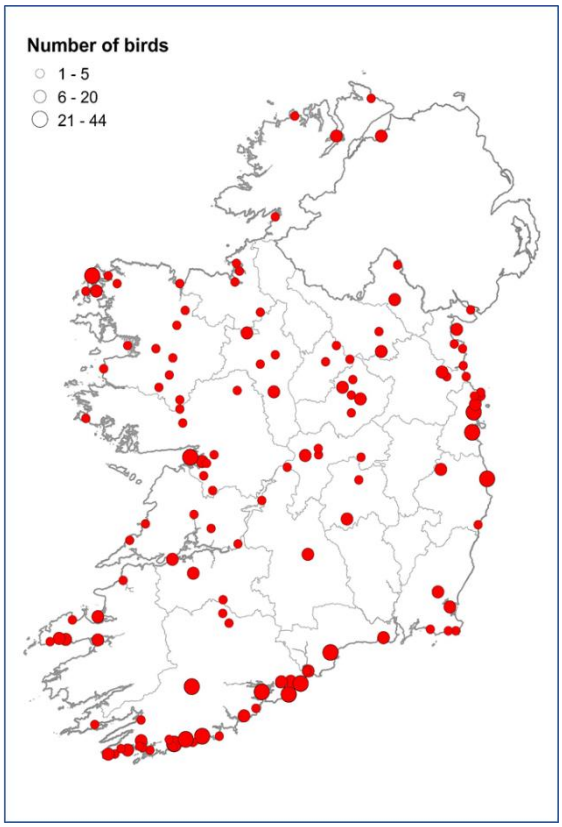


Figure 56 Distribution map for Snipe showing sites that supported an average of one or more bird between 2011/12 and 2015/16 (Photo: John Fox).

Ireland's wintering Common Snipe (hereafter Snipe) comprise residents and migrants from the nominate *gallinago* race which breeds across northern Europe, as well as migrants from the *faeroeensis* population, which breeds in Iceland, the Faeroes and the Shetland and Orkney Islands (Delany *et al*., 2009). Wetlands International (2018) lists the flyway population of nominate *gallinago* as being stable, while the population trend of *faeroeensis* is unknown. The majority of the mainly Icelandic-breeding *faeroeensis* are thought to overwinter in Ireland (Wernham *et al*., 2002, Delany *et al*., 2009) meaning Ireland provides vital wintering grounds for this population that numbers around 5,700 individuals (Wetlands International, 2018).

The population trend for Snipe in Ireland remains uncertain as they are very difficult to monitor and are almost certainly undercounted. They are a skulking species with a widely dispersed distribution and many remain undetected unless flushed. Snipe were recorded at 159 sites during the period 2011/12 – 2015/16 and twelve sites supported this species with most regularity (Table 55).

Table 55 Table showing sites that supported Snipe in five or more seasons between 2009/10 and 2015/16 with an average of 20 birds or more between 2011/12 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15
Cork Harbour	72	70	33	55	32	56	44	44	56
Termoncarragh & Annagh Marsh	180	44	47	35	31	64		44	64
Ballymacoda	3	31	87	34		22	3*	36	87
Broadmeadow (Malahide) Estuary	10	46	20	25	56	25	36	32	56
North Wicklow Coastal Marshes	37	20	35	44	16	30	22	29	44
Ballycotton Shanagarry	57	34	17	23	45	35	23	29	45
Rosscarbery	12	10	9	10	31	47	38	27	47
Dublin Bay	16	18	12	62	20		31	25	62
Inishcarra Reservoirs	52	12	3	46	23		47	22	47
Clonakilty Bay	2	62	64	15	10	6	10	21	64
Inner Galway Bay	8	5	25	6	3	13	56	21	56
Wexford Harbour & Slobs	73	31	4	31	36	20	10	20	36

4.56 Black-tailed Godwit *Limosa limosa* Guilbneach earrdhubh

islandica, Iceland (br)

International threshold:	1,100	**Population change (%):**	
All-Ireland threshold:	200	5 year:	+3.0
Population size (2011-2016):		12 year:	+29.8
All-Ireland:	19,800	22 year:	+77.7
ROI:	17,862	Historical:	+135.0
Associated with ROI SPA network:	16,575	Average annual change:	+3.5

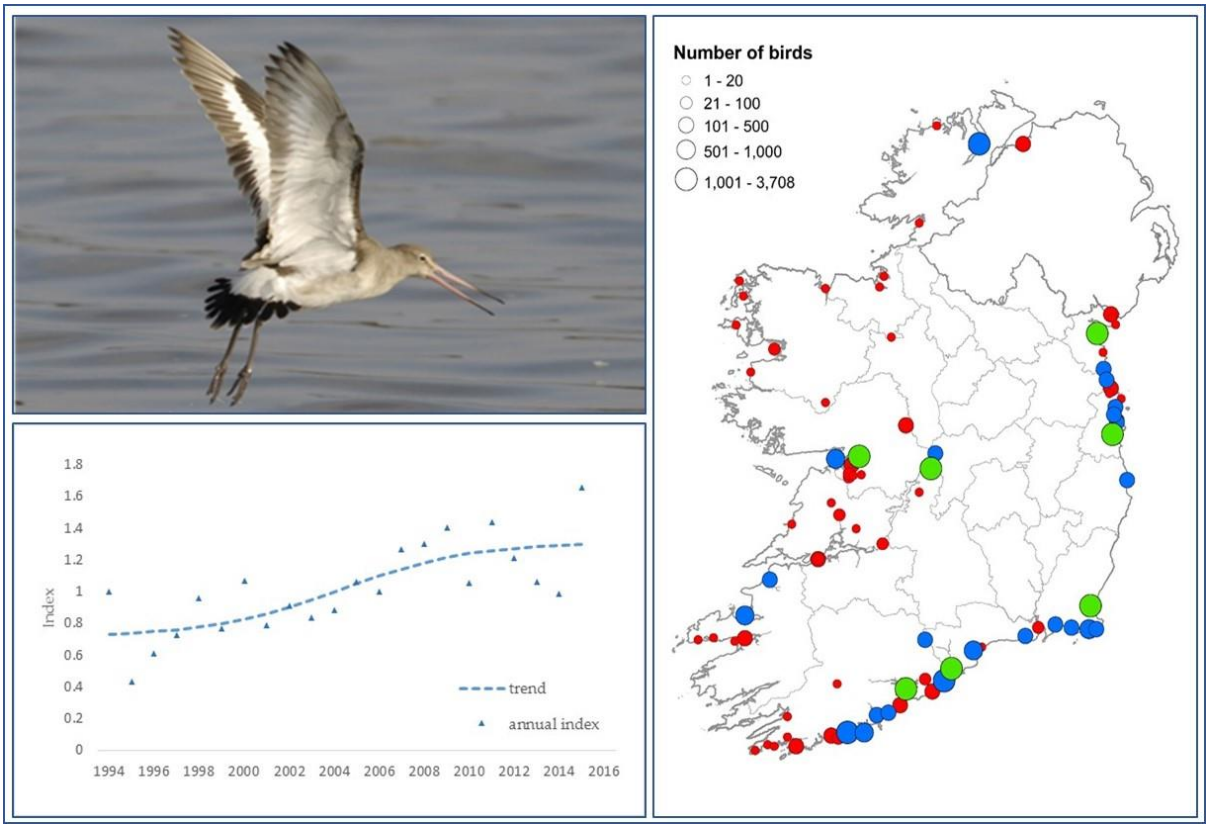


Figure 57 Distribution map and graphed population trend for Black-tailed Godwit. The distribution map illustrates sites supporting numbers of international importance (green circles), national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: John Fox).

Wetlands International (2018) recognises four populations of the Black-tailed Godwit in Western Eurasia and Africa and one of these, *Limosa limosa islandica,* breeds almost exclusively in Iceland and winters in Ireland, Britain, France, Portugal, Spain and Morocco (Delany *et al*., 2009). This population has undergone a sustained population increase and range expansion over the last century (e.g. Gill *et al*., 2007; Gunnarsson *et al*., 2011).

Numbers of Black-tailed Godwit wintering in Ireland have shown a more or less sustained increase over time, with an overall average rate of 3.5% per year increase resulting in a 78% increase in numbers over a 22-year period. A similarly impressive increase has been reported in the UK where the index reached a record high in the 2016/17 season (Frost *et al*., 2018).

Black-tailed Godwits are distributed predominantly on estuaries along the east and south coasts, and also at a small selection of inland sites. They were recorded at 89 sites during the current period (101 sites during the period 2009/10 - 2015/16). At many of their coastal sites, they use both estuaries and nearby grasslands and flooded fields throughout the winter for feeding (Hutchinson & O'Halloran, 1994; Hayhow, 2009).

Seven sites supported numbers of international importance during the current period, half the number identified during the former period but likely simply due to the 1% international threshold increasing from 470 to 1,100 individuals in the intervening time. Of these sites, Dundalk Bay and Cork Harbour are now promoted above Little Brosna Callows in the top rankings. However the drop in five-year mean for the latter site may be a result of a lower count coverage during the current period, compared with the former period. Of note also is Seagrange Park, which supported numbers of international importance during the former period, but for which no data were available for the current period. Notable increases in five-year means are observed for Blackwater Estuary, Dublin Bay and Rahasane Turlough.

Twenty-three sites supported numbers of national importance during the current period based on the five-year mean, while seven of these sites recorded peak counts that exceeded the threshold for international importance. A notable increase in the five-year mean was recorded for Lough Swilly, possibly linked to an increase in count coverage during the period, while numbers at Tacumshin Lake increased fourfold. Conversely, the five-year mean at Blackwater Callows has declined substantially for this former internationally-ranked site despite relatively similar count coverage during both current and former periods. Of the sites no longer of significance, Lough Foyle (NI) and Ringabella Creek are notable for recording a much lower five-year mean for the current, compared with the previous period.

As noted previously, incomplete count coverage of the Shannon & Fergus Estuary in recent seasons precludes an accurate assessment of its status for Black-tailed Godwits using I-WeBS data. A recent survey of the estuarine system recorded a peak count of 3,440 individuals during September 2017 (MKOS, 2017) suggesting that this site still continues to support numbers of international importance.

Table 56 Table showing sites supporting internationally and/ or nationally important numbers of Black-tailed Godwit ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of international importance										
Dundalk Bay	5,167	2,631	3,381	3,157	4,647	3,749	3,606	3,708	4,647	Oct, Mar
Cork Harbour	1,339*	2,415*	2,955	2,770	2,681	3,299	3,048	2,951	3,299	Sep
Little Brosna Callows			4,150	254	380	3,423	150*	2,052	4,150	Nov
Wexford Harbour & Slobs	1,900*	2,493*	3,100	410	2,321	1,475	1,926	1,846	3,100	Nov
Blackwater Estuary	509	407*	378	525	815	634	5,150	1,500	5,150	Jan
Dublin Bay	1,449	1,375	927	1,362	1,768	873	2,185	1,423	2,185	Mar
Rahasane Turlough	500	100	600	250	1,700	2,000	2,500	1,410	2,500	Oct, Nov

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Lough Swilly	198	522	742	1,500	786	915	1,529	1,094	1,529	Mar
Clonakilty Bay [3]	1,329	878	1,192	749	871	1,551	1,080	1,089	1,551	Oct
Ballymacoda [3]	572*	398*	1,404	629		1,068	135*	1,034	1,404	Nov
Dungarvan Harbour [3]	1,458	1,648	677	842	520	1,386	1,136	912	1,386	Jan
Courtmacsherry Bay, Broadstrand Bay & Dunworley [3]	654	693	807	763	677	434	696	675	807	Dec
Tralee Bay, Lough Gill & Akeragh Lough	949	840	1,408	1,300	230	6	83	605	1,408	Dec
Tacumshin Lake	808	183	760	707	860	80	380	557	860	Mar
Inner Galway Bay		9	1,004	29	1,115		470	524	1,115	Jan
Bandon Estuary [1]					493			493	493	
Rogerstown Estuary [3]	568	148	450	883	597	237	191	472	883	Oct, Mar
Tramore Back Strand	37*	322	130	500	517	575		431	575	Dec, Jan
Lady's Island Lake [1]	501	133	101	1096	356	360	102	403	1,096	Mar
Boyne Estuary	264	309	319	249	331	457	406	352	457	Sep
Nanny Estuary & shore [1]	10	232	183*	90*	276	105	545	309	545	Sep
Cashen River & Estuary [1]						28	1,200	307	1,200	Feb, Mar
North Wicklow Coastal Marshes [1]	297	173	185	125*	386	65*	343	305	386	
The Cull & Killag (Ballyteige)	220	93	120	190	291	576	230	281	576	Nov
Baldoyle Bay	270				389	139	296	275	389	Sep, Dec, Mar
Bannow Bay	5,653		584		188	190	60	256	584	
Blackwater Callows [3]	1451		119	36	758	50		241	758	Nov
Broadmeadow (Malahide) Estuary	478	258	296	355	206	167	121	229	355	Sep, Mar
Stick Estuary (Oysterhaven)	132	188	220	390	155	232	135	226	390	
Shannon Callows [4]		220		220				220	220	
Sites no longer supporting numbers of national importance										
Ballycotton Shanagarry	62	76*	173	177	152	207	235	189	235	Oct
Ringabella Creek	201	99	86	132	174	158	149	140	174	
Lough Foyle †	113	213	122	66	318	97	50	131	318	
Shannon & Fergus Estuary [4]		1,112		121				121	121	
Shannon & Fergus Estuary		2500	150	400	13	4		113	400	
Waterford Harbour	65		115					58	115	

Sites that supported numbers of international importance during the former period but no data were available for the current period: Seagrange Park.

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[3]Site demoted (from supporting numbers of international importance to numbers of national importance) since the 2001/02 to 2008/09 period.

[4]Aerial census data.

4.57 Bar-tailed Godwit *Limosa lapponica* Guilbneach stríocearrach

lapponica, N. Europe (br)

International threshold:	1,500	**Population change (%):**	
All-Ireland threshold:	170	5 year:	-17.6
Population size (2011-2016):		12 year:	+0.2
All-Ireland:	16,530	22 year:	+31.7
ROI:	13,385	Historical:	-26.1
Associated with ROI SPA network:	12,303	Average annual change:	+0.5

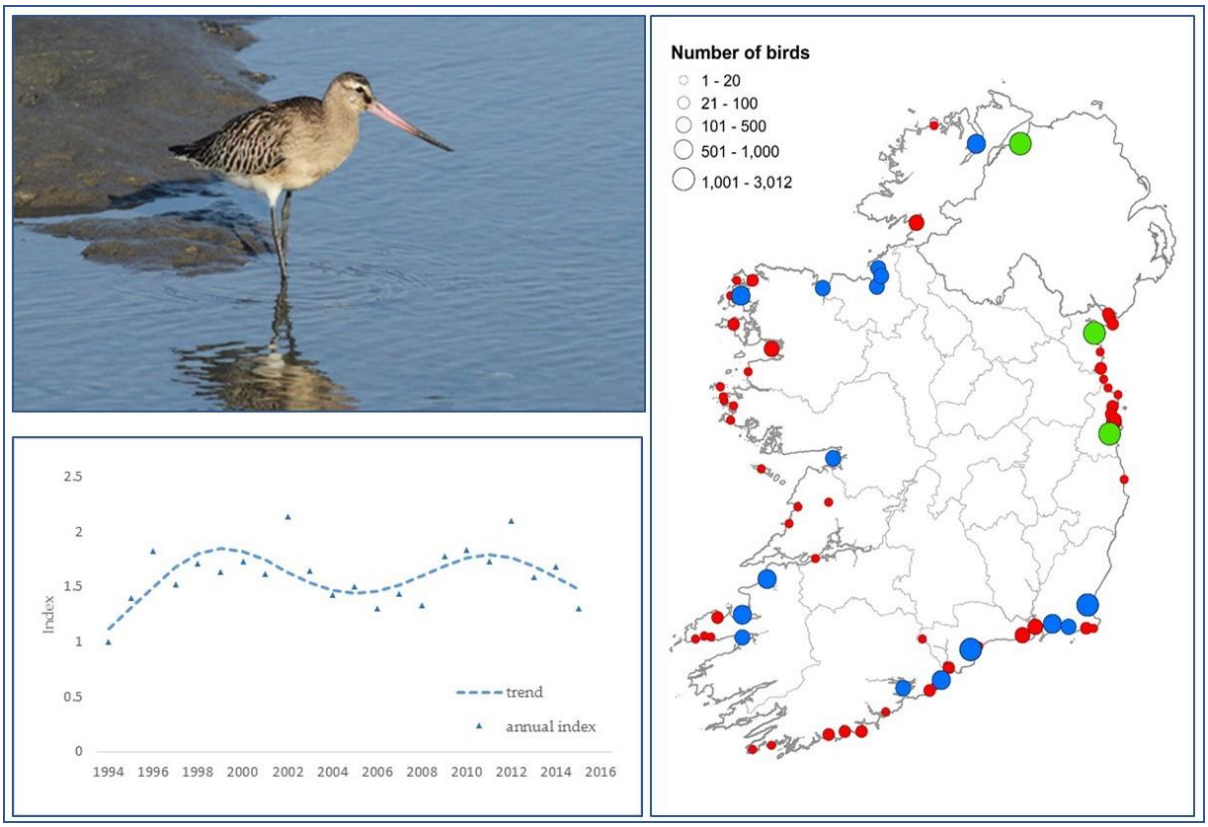


Figure 58 Distribution map and graphed population trend for Bar-tailed Godwit. The distribution map illustrates sites supporting numbers of international importance (green circles), national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Dick Coombes).

Wetlands International (2018) recognises three populations of the Bar-tailed Godwit in Western Eurasia and Africa and the nominate population *lapponica,* which breeds in northern Europe and western Siberia (Delany *et al*., 2009), occurs during winter in Ireland. This flyway population is increasing (Wetlands International, 2018). Numbers of Bar-tailed Godwit have remained broadly stable throughout I-WeBS although a drop in numbers in recent seasons has resulted in a short-term (5-year) trend for decline. Numbers wintering in the UK exhibited a substantial decline during the 2000s (Musgrove *et al*., 2011) but have since recovered to near former levels (Frost *et al*., 2018).

Bar-tailed Godwit distribution in Ireland is entirely coastal, especially in sandy intertidal habitats and there is an east coast bias to their distribution. They were recorded at 75 sites during the current period (2011/12 – 2015-16). Numbers of international importance were recorded at three sites, namely Dundalk Bay, Lough Foyle (NI) and Dublin Bay, consistent with the top three ranked sites during the former period (2001/02 – 2008/09) and all three sites well exceeding the new larger 1% international threshold of 1,500.

Wexford Harbour & Slobs has been demoted from supporting numbers of international importance and now joins the list of 16 sites supporting numbers of national importance. Of these, Dungarvan Harbour, Bannow Bay, Blacksod & Tullaghan Bays and Tralee Bay, Lough Gill & Akeragh Lough remain the highest ranked sites with five-year means higher than the former period. Four sites are no longer of significance during the current period (Tramore Back Strand, Baldoyle Bay, Broadmeadow (Malahide) Estuary and Hick's Tower & Robswall) and all have substantial declines in their five-year means compared to the former period. As noted previously, incomplete count coverage of the Shannon & Fergus Estuary in recent seasons precludes an accurate assessment of its status for Bar-tailed Godwits, but as high numbers have been recorded previously from aerial surveys and ground-based surveys, this site may well continue to support numbers of national importance.

Table 57 Table showing sites supporting internationally and/or nationally important numbers of Bar-tailed Godwit ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of international importance										
Dundalk Bay	4,533	3,119	3,135	5,038	3,431	1,821	1,637	3,012	5,038	Jan
Lough Foyle †	1,501	1,473	1,801	2,611	2,087	2,675	2,521	2,339	2,675	
Dublin Bay	1,540	1,745	1,917	2,141	1,710	1,658	2,173	1,920	2,173	Jan, Mar
Sites supporting numbers of national importance										
Dungarvan Harbour	1,023	1,000	962	996	1,151	1,127	1,321	1,111	1,321	Dec
Wexford Harbour & Slobs [3]	200*	913*	1,250	830	435	1,644	964	1,025	1,644	Nov, Jan
Blacksod & Tullaghan Bays	872	291*	1,016	1,085	1,223	740	856	984	1,223	Nov
Bannow Bay	1,050		276		808	890	1,114	772	1,114	Dec
Tralee Bay, Lough Gill & Akeragh Lough	524	421	1,170	1,280	30	350	388	644	1,280	Feb
Ballymacoda	30*	44*	627	598		547	50*	591	627	
Cashen River & Estuary [1]			23		36*	122	1,600	582	1,600	
Lough Swilly [1]	406	399	871	683	418	443	256	534	871	Feb
Inner Galway Bay [1]	467	605	590	585	271	672	219	467	672	Jan
Drumcliff Bay Estuary [1]	863	168	496	589	507	359	137	418	589	Feb
The Cull & Killag (Ballyteige) [1]	233	158	161	397	430	521	90	320	521	Jan
Castlemaine Harbour & Rossbehy [1]	221*	250	115	332	288	437	405	315	437	
Ballysadare Bay [1]	15	54	400	255	297	146	437	307	437	Jan
Cork Harbour	396*	301*	312	351	300	290	249	300	351	Jan
Killala Bay	15	241	131	324	263	196	310	245	324	

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sligo Harbour	438	220	277	232	150	260	303	244	303	
Sites no longer supporting numbers of national importance										
Tramore Back Strand		195	60	265	112	147		146	265	Jan, Feb
Baldoyle Bay	105				162	150	48	120	162	Jan
Broadmeadow (Malahide) Estuary	358	286	62	213	133	14	60	96	213	Jan
Hick's Tower & Robswall	400	55	64					64	64	

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[3]Site demoted (from supporting numbers of international importance to numbers of national importance) since the 2001/02 to 2008/09 period.

4.58 Whimbrel *Numenius phaeopus* Crotach eanaigh

islandicus, Iceland, Faeroes, Scotland (br)

passage migrant

International threshold: 6,700

Mean/ Peak (2011/12 – 2015/16): 97/170

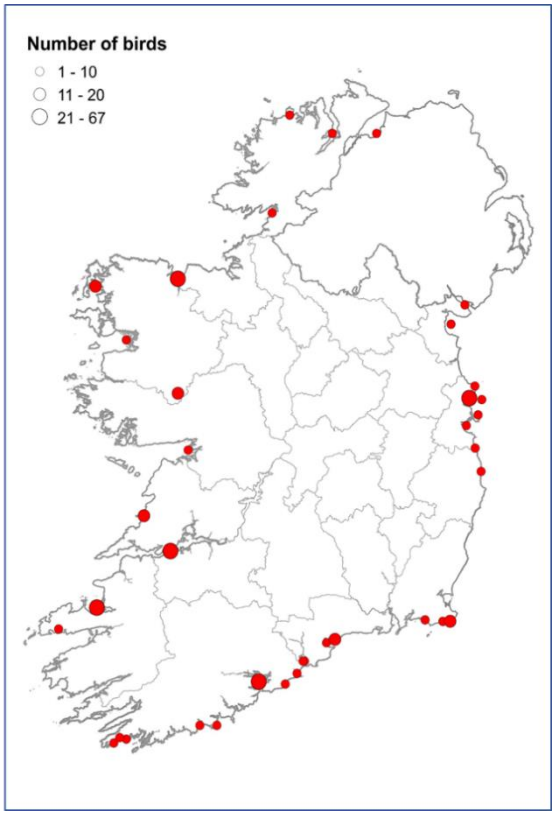


Figure 59 Distribution map for Whimbrel showing peak counts (2011/12 – 2015/16) (Photo: Dick Coombes).

Five populations of Whimbrel are now recognised in Western Eurasia and Africa (Wetlands International, 2018). The population of the form *islandicus* breeds in Iceland and migrates to west Africa in autumn (Carneiro & Alves, 2017; Alves *et al*., 2016) and it is these birds that we see in Ireland as passage migrants. The size and trend of this population is uncertain (Delaney *et al*., 2009).

During the return migration to Iceland in spring, recent research has shown that Whimbrel do not always fly direct to Iceland and some may perform a stopover in Ireland, hence Whimbrel are observed more often in spring than autumn (Carneiro & Alves, 2017; Alves *et al*., 2016).

Table 58 Table showing sites that supported Whimbrel in five or more seasons between 2009/10 and 2015/16 with the peak count recorded between 2011/12 – 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15
Cork Harbour	11	13	2	67	8	4	3	17	67
Rogerstown Estuary	2		2	28	1	1	1	7	28
Ballymacoda	2	3	3	1		2	1	2	3
Blackwater Estuary	1		2	1	1	1	1	1	2
Lower Blackwater River		1	1		1	1	1	1	1

Other sites recorded in less than five seasons (peak count 2011/12 – 2015/16):

Ballybackagh (19), Ballycotton Shanagarry (1), Blacksod & Tullaghan Bays (13), Bray Harbour (1), Carlingford Lough (NI) (6), Clew Bay (9), Clonakilty Bay (3), Clonea Strand (14), Courtmacsherry Bay, Broadstrand Bay & Dunworley (1), Croagh Bay (1), Crookhaven (1), Dingle Harbour (2), Donegal Bay (1), Dublin Bay (4), Dundalk Bay (7), Dunfanaghy Estuary (8), Dungarvan Harbour (2), Inner Galway Bay (1), Ireland's Eye (1), Killala Bay (50), Lady's Island Lake (11), Lambay Island (10), Lough Foyle (NI) (1), Lough Swilly (2), Mid-Clare Coast (Mal Bay – Doonbeg Bay) (12), North Wicklow Coastal Marshes (2), Shannon & Fergus Estuary (52), Skerries Islands (2), Tacumshin Lake (1), The Cull & Killag (Ballyteige) (1), Toormore Bay (1), Tralee Bay, Lough Gill & Akeragh Lough (28).

4.59 Curlew *Numenius arquata* Crotach

arquata, Europe (br)

International threshold:	7,600	**Population change (%)**	
All-Ireland threshold:	350	5 year:	-2.4
Population size (2011 – 2016):		12 year:	-21.1
All-Ireland:	35,240	22 year:	-41.0
ROI:	28,300	Historical:	-64.2
Associated with ROI SPA network:	15,408	Average annual change:	-2.8

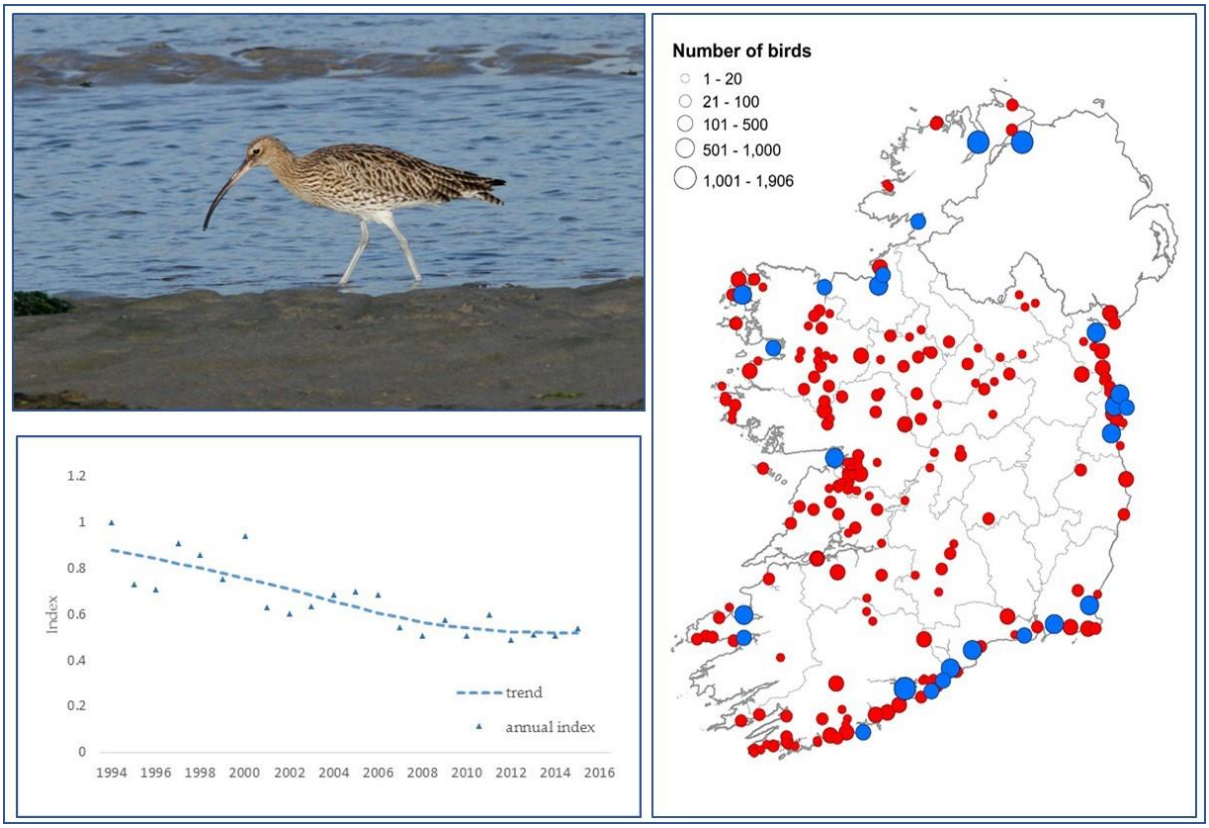


Figure 60 Distribution map and graphed population trend for Curlew. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Dick Coombes).

Three populations of the Eurasian Curlew (hereafter Curlew) have been recognised, with birds overwintering in Ireland belonging to the nominate *arquata* race which breeds in Europe and winters mainly in Europe and western Africa (Delany *et al.*, 2009). This population is in decline (Wetlands International, 2018).

Declines in breeding populations of *N. a. arquata* have been recorded or are suspected to be occurring across much of the breeding range (Brown, 2015). While a 60% decline in breeding Curlew over the

last 25 years was estimated for the Republic of Ireland by the last Bird Atlas (2007-11 Bird Atlas unpublished data) (Balmer *et al*., 2013), a more recent national survey (2015-2017) recorded a total of 138 breeding pairs, representing a population decline of 96% in less than 30 years (O'Donoghue *et al*., 2019).

The numbers of Curlew wintering in Ireland have declined since the 1980s (Sheppard 1993, Crowe *et al*., 2008), and numbers in the Republic of Ireland have declined throughout I-WeBS by on average almost 3% per year. This decline has started to level off in recent seasons assessed however, which has resulted in the redcued rate of decline for the recent 5-year trend. In Britain, wintering numbers reportedly increased during the 1980s and 1990s but have shown a steady decline since the early 2000s, consistent with a similar decline since the mid-1990s in Northern Ireland (Calbrade *et al*., 2010; Frost *et al*., 2018).

Curlew are one of our most widespread wader species, occurring in a variety of wetland and non-wetland habitats, although largest numbers occur mainly on muddy estuaries and shores. A relatively large proportion of the national population also occur along non-estuarine coasts (Lewis *et al*., 2017).

Curlew were recorded at 220 sites during the period 2011/12 – 2015/16. Numbers of national importance were recorded at 25 sites; an increase of nearly double on the former period and due to a lowering of the 1% all-Ireland threshold from 550 to 350. Lough Foyle, Lough Swilly and Cork Harbour remain the top three-ranked sites in Ireland for this species; consistent with the former period (Boland & Crowe, 2012).

Table 59 Table showing sites supporting nationally important numbers of Curlew ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Lough Foyle †	1,834	1,656	2,106	1,763	2,097	1,902	1,661	1,906	2,106	
Lough Swilly	1,720	1,800	1,742	1,351	2,437	2,336	1,432	1,860	2,437	Sep, Feb
Cork Harbour	992*	1,397*	1,662	1,266	1,163	1,987	1,524	1,520	1,987	Sep
Dublin Bay	1,240	688	1,169	874	932	1,424	567	993	1,424	
Wexford Harbour & Slobs	440*	409*	561	629	305	1320	1,024	768	1,320	Nov
Tralee Bay, Lough Gill & Akeragh Lough	1,002	1,250	1,341	1,468	242	209	523	757	1,468	Feb
Dundalk Bay	842	1,079	796	1,105	707	349	607	713	1,105	Oct, Feb
Blackwater Estuary	435	891*	466	605	1,072	598	701	688	1,072	Sep
Rogerstown Estuary	803	33	922	518	684	600	625	670	922	Mar
Ballysadare Bay [1]	408	446	501	552	774	444	836	621	836	Jan
Inner Galway Bay	843	690	672	409	578	615	744	604	744	Nov
Bannow Bay	824		183		1,016	307	812	580	1,016	Jan
Blacksod & Tullaghan Bays [1]	454	374*	722	544	624	609	359	572	722	
Dungarvan Harbour [1]	659	763	447	391	861	564	591	571	861	Feb
Skerries Islands [1]					460		550	505	550	Feb
Castlemaine Harbour	367*	977	619	670	363	350	428	486	670	Dec, Feb

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
& Rossbehy [1]										
Clew Bay [1]	488	512	600	585	363	317	423	458	600	Feb
Ballymacoda [1]	145*	393*	508	367		485	457*	453	508	Sep
Donegal Bay [1]	396	392	486	485	409	447	393	444	486	Oct
Courtmacsherry Bay, Broadstrand Bay & Dunworley	250	270	535	375	422	423	410	433	535	Sep, Feb
Sligo Harbour [1]	480	355	468	410	577	256	366	415	577	Jan
Ballycotton Shanagarry [1]	288	153*	476	406	370	404	394	410	476	Feb
Killala Bay [1]	51	342	548	279	331	368	517	409	548	Jan
Tramore Back Strand [1]	98*	477	233	472	595	204		376	595	Jan, Feb
Lambay Island [1]	200	100			350		200*	350	350	
Sites no longer supporting numbers of national importance										
Shannon & Fergus Estuary [4]	595	476	222	438				330	438	
Blackwater Callows	248		62	97	400	333		223	400	Feb
Carlingford Lough †			309	153	106	140	161	174	309	

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[4]Aerial census data.

4.60 Common Sandpiper *Actitus hypoleucos* Gobadán coiteann

W. & Central Europe (br)

International threshold: 12,000

Mean/ Peak (2011/12 – 2015/16): 24/42

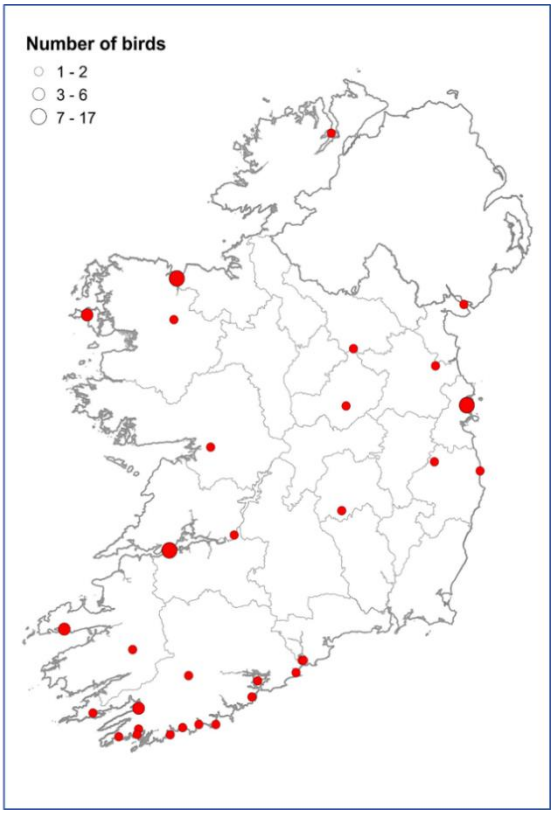


Figure 61 Distribution map for Common Sandpiper showing peak counts (2011/12 – 2015/16) (Photo: Dick Coombes).

Two populations of the Common Sandpiper are recognised in western Eurasia. Birds breeding in western and central Europe winter in west Africa, while birds breeding in eastern Europe and western Siberia, winter mainly in eastern, central and southern Africa. These populations are considered to be declining/stable and stable respectively (Wetlands International, 2018).

Common Sandpiper are more typically a breeding migrant to Ireland with a very short breeding season (Wernham *et al*., 2002) and a distribution focused along the west coast (Balmer *et al*., 2013). The breeding population is believed to migrate to west Africa, south of the Sahara (Wernham *et al*., 2013).

During the non-breeding season, Ireland supports a small number of Common Sandpiper although their breeding origins are unknown. As a small number of breeding Common Sandpiper are known to remain in Britain to overwinter (Dougall *et al*., 2010), this may also occur in Ireland despite the species being highly migratory (del Hoyo *et al*., 1996).

Common Sandpiper were recorded at 41 sites between 2011/12 and 2015/16, and regularly recorded at three sites, Broadmeadow (Malahide) Estuary, An Trá Beg and Cork Harbour (Table 60). The peak count was 17 individuals recorded at Broadmeadow (Malahide Estuary) in February 2013.

Table 60 Table showing sites that supported Common Sandpiper in five or more seasons between 2009/10 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15
Broadmeadow (Malahide) Estuary	6	4	1	17		1		4	17
An Trá Beg	1		2	3		2	2	2	3
Cork Harbour		2	1		1	1	1	1	1

Other sites recorded in less than five seasons (peak count 2011/12 – 2015/16):

Achill Island (6), Ballydehob Estuary (1), Ballymacoda (2), Bantry Bay (3), Bear Haven (1), Blackwater Estuary (2), Carlingford Lough (NI) (1), Clonakilty Bay (1), Courtmacsherry Bay, Broadstrand Bay & Dunworley (1), Durrow Curragh (River Erkina) (2), Inishcarra Reservoirs (2), Killala Bay (17), Lough Cullin (1), Lough Ennell (1), Lough Leane & Killarney Valley (1), Lough Sheelin (1), Lough Swilly (1), Lower Blackwater River (1), Myross Island & Inlet (Blind Harbour) (1), North Wicklow Coastal Marshes (2), Poulaphouca Reservoir (1), Rahasane Turlough (2), Ringabella Creek (1), River Boyne (1), River Shannon (Lower) (2), Rosbrin Cove (2), Rosscarbery (1), Shannon & Fergus Estuary (11), Toormore Bay (2).

4.61 Spotted Redshank *Tringa erythropus* Cosdeargán breac

N. Scandinavia & N.W. Russia (br)

Scarce winter visitor

International threshold: 1,000

Mean/ Peak (2011/12 – 2015/16): 13/17

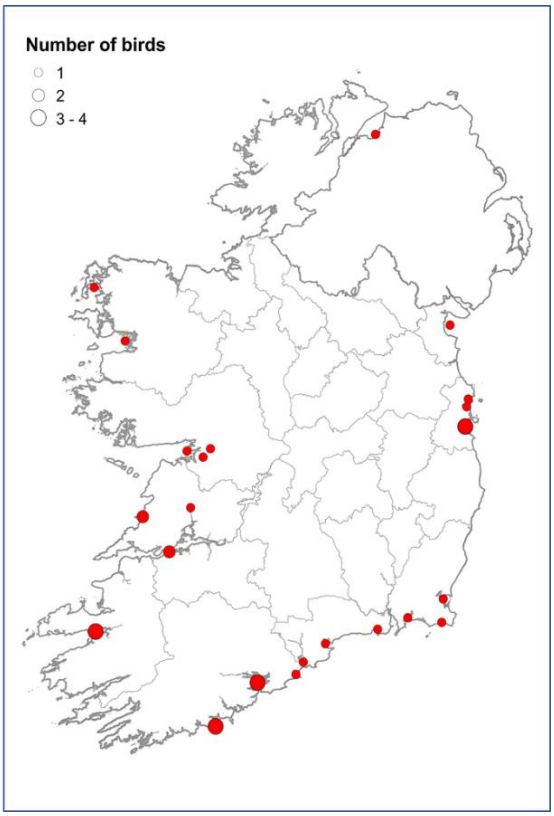


Figure 62 Distribution map for Spotted Redshank showing peak counts (2011/12 – 2015/16) (Photo: Mark Carmody).

The Spotted Redshank is considered a scarce winter visitor to Ireland. The European breeding population of Spotted Redshank breeds in Fennoscandia and western Russia and migrates south to winter in west European coastal areas and west and central Africa (Delany *et al*., 2009). The trend of this population is uncertain (Wetlands International, 2018).

Small numbers occur in Ireland throughout the non-breeding period, and Spotted Redshank was recorded at 23 sites between 2011/12 and 2015/16, occurring with most regularity at Cork Harbour, Courtmacsherry Bay, Broadstrand Bay & Dunworley, Wexford Harbour & Slobs and Dundalk Bay (Table 61).

Table 61 Table showing sites that supported Spotted Redshank in five or more seasons between 2009/10 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15
Cork Harbour		2	4	4	2	3	2	4	4
Courtmacsherry Bay, Broadstrand Bay & Dunworley	1	1	2	3	2	1	1	2	3
Wexford Harbour & Slobs	3		1		1	1	1	1	3
Dundalk Bay	1			1	1	1	1	1	1

Other sites recorded in less than five seasons (peak count 2011/12-2015/16):

Ballyallia Lake (1), Ballymacoda (1), Bannow Bay (1), Blacksod & Tullaghan Bays (1), Blackwater Estuary (1), Broadmeadow (Malahide) Estuary (1), Castlemaine Harbour & Rossbehy (4), Clew Bay (1), Dublin Bay (3), Dungarvan Harbour (1), Inner Galway Bay (6), Kiltiernan Turlough (1), Lough Foyle (NI) (1), Mid-Clare Coast (Mal Bay – Doonbeg Bay) (2), Rahasane Turlough (1), Rogerstown Estuary (1), Shannon & Fergus Estuary (2), Tacumshin Lake (1), Tramore Back Strand (1).

4.62 Greenshank *Tringa nebularia* Laidhrín glas

N. Europe (br)

International threshold:	3,300	**Population change (%):**	
All-Ireland threshold:	20	5 year:	-1.5
Population size (2011 – 2016):		12 year:	+11.5
All-Ireland:	1,320	22 year:	+83.9
ROI:	1,208	Historical:	+182.3
Associated with ROI SPA network:	594	Average annual change:	+2.7

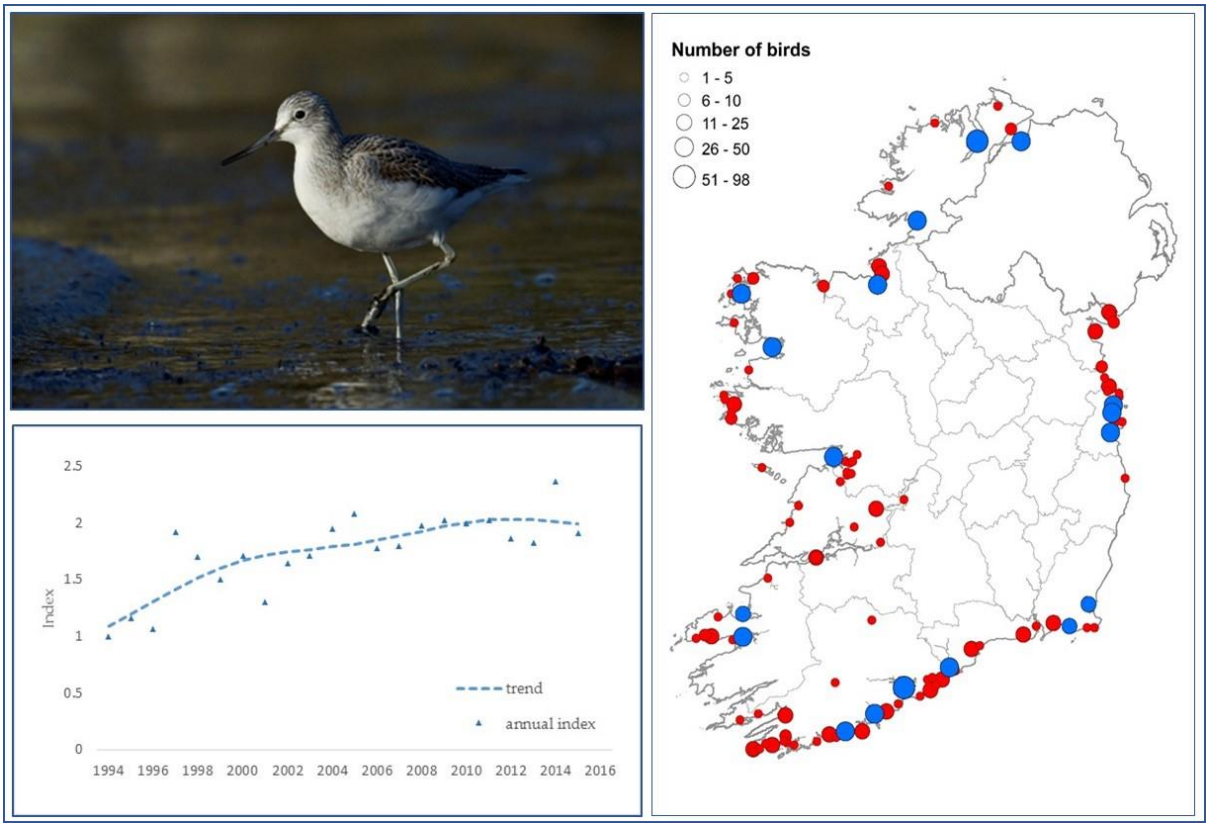


Figure 63 Distribution map and graphed population trend for Greenshank. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Clive Timmons).

Two populations of Common Greenshank (hereafter Greenshank) are recognised in Western Eurasia and Africa and the Greenshank wintering in Ireland originate from the population that breeds across northern Europe, from Scotland east to Finland and the Baltic States (Delany *et al*., 2009). It has been suggested that many Greenshank wintering in Ireland originate from the Scottish breeding population (Nethersole-Thompson & Nethersole Thompson, 1979; Hutchinson, 1986), however the lack of ring-recoveries from the Scottish population means that this is not confirmed (Wernham *et al*., 2002). The population trend across the breeding range is thought to be stable/increasing (Wetlands International, 2018) and across the long-term, numbers wintering in Ireland have increased steadily (Figure 63),

consistent with an increasing trend observed in the UK (Frost *et al*., 2018). The increase in wintering numbers is at least partly attributed to an increasingly milder climate (e.g. Maclean *et al*., 2008; Pearce-Higgins *et al*., 2011).

Greenshank are almost exclusively distributed along the coast of Ireland and was recorded at 107 sites during the current period. A large proportion (>40%) of the national population has been estimated to occur along non-estuarine coast (Lewis *et al*., 2017). The most recent Bird Atlas (2007-2011) (Balmer *et al*., 2013) revealed the species at a few inland sites in Ireland, and in the UK, where an increase in abundance and the number of sites occupied is evident (Mendez *et al*., 2018).

Based on the most recent five-year mean, 18 sites supported numbers of national importance during the current period, including three sites that were not of significance during the former period (2001/02 and 2008/09). Cork Harbour and Lough Swilly supported the largest numbers, consistent with the former period. Indeed, with the exception of Castlemaine Harbour & Rossbehy, all top ten ranked sites shown in Table 62, were ranked within the top ten during the former period. All of these sites are Special Protection Areas with the exception of Clew Bay. Improved count coverage at Castlemaine Harbour & Rossbehy during the period assessed is most likely responsible for the improved ranking of this site.

Table 62 Table showing sites supporting nationally important numbers of Greenshank ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Cork Harbour	79*	93*	88	82	85	124	111	98	124	Oct
Lough Swilly	68	44	55	50	92	108	80	77	108	Sep
Dublin Bay	28	43	40	46	34	47	78	49	78	
Rogerstown Estuary	50	14	83	32	36	35	59	49	83	Sep
Inner Galway Bay	45	35	55	44	43	40	38	44	55	Jan
Clew Bay	35	39	35	44	53	42	44	44	53	Oct, Nov
Broadmeadow (Malahide) Estuary	29	26	26	43	64	30	34	39	64	Sep
Castlemaine Harbour & Rossbehy [1]	9*	43	8	26	2	123	21	36	123	Oct, Nov
Ballysadare Bay	25	50	41	18	54	30	28	34	54	Jan
Blackwater Estuary	29	33*	24	24	64	33	24	34	64	Sep
Donegal Bay	21	31	23	31	44	50	16	33	50	Feb
Clonakilty Bay	35	21	32	16	24	41	42	31	42	Sep
Lough Foyle †	47	31	23	35	23	29	43	31	43	
Blacksod & Tullaghan Bays	27	12*	31	34	23	38	25	30	38	Nov
Bandon Estuary [1]					26			26	26	
Wexford Harbour & Slobs [1]	4*	6*	16	9	15	27	46	23	46	Oct
Tralee Bay, Lough Gill & Akeragh Lough	10	17	14	18	20	30	27	22	30	Oct
The Cull & Killag	19	5	15	19	23	17	24	20	24	

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
(Ballyteigue)										
Sites no longer supporting numbers of national importance										
Dungarvan Harbour	22	22	13	16	16	31	21	19	31	Feb
Carlingford Lough †	14	15	29	8	15	14	23	18	29	
Dundalk Bay	23	17	11	21	14	17	21	17	21	
Courtmacsherry Bay, Broadstrand Bay & Dunworley	32	18	13	12	19	26	13	17	26	Sep
Shannon & Fergus Estuary	5	11	14	16	23	9	10	14	23	Sep, Oct
Baldoyle Bay	25				6	11	3	7	11	Oct, Nov, Dec

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

4.63 Redshank *Tringa totanus* Cosdeargán

robusta, Iceland, Faeroe Islands (br)[1]

totanus, Britain & Ireland (br)[2]

International threshold:	2,400[1]/ 760[2]	**Population change (%):**	
All-Ireland threshold:	240	5 year:	-2.5
Population size (2011 – 2016):		12 year:	-13.7
All-Ireland:	23,800	22 year:	+11.2
ROI:	16,812	Historical:	+2.3
Associated with ROI SPA network:	12,898	Average annual change:	+0.7

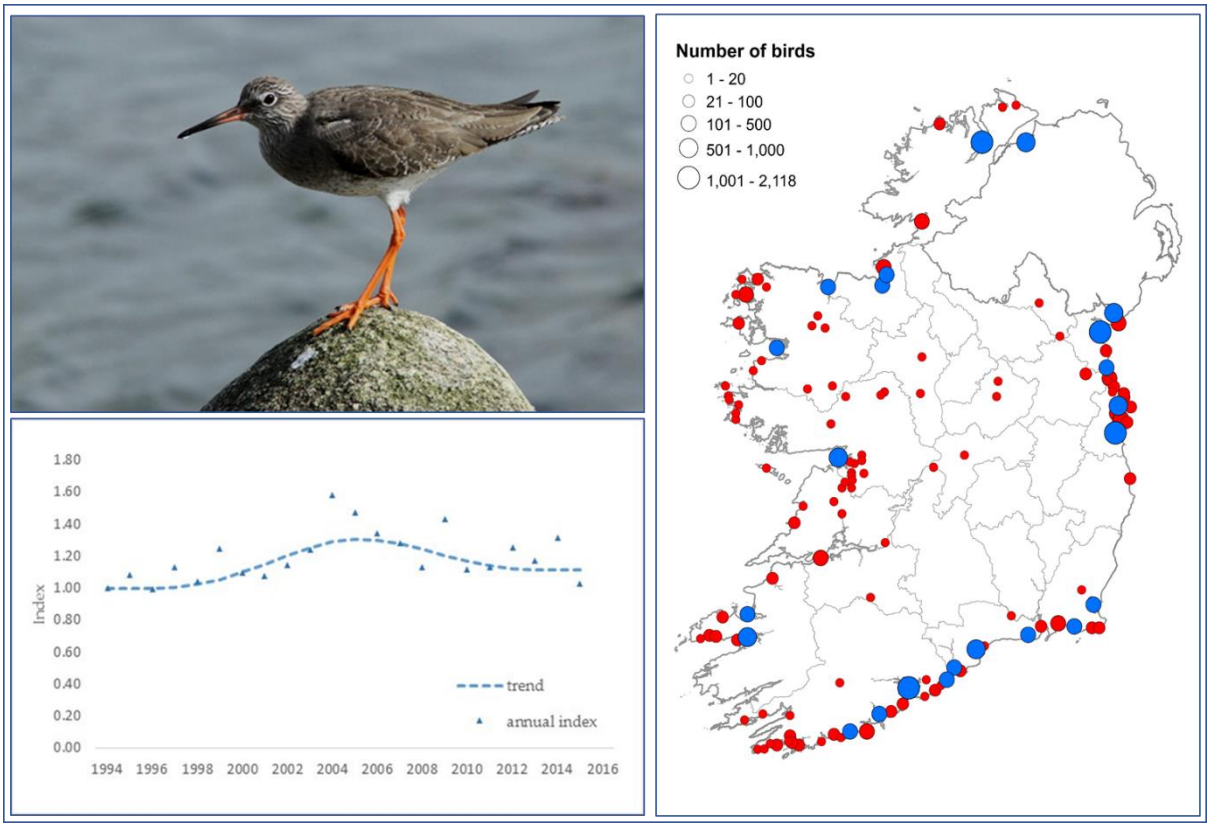


Figure 64 Distribution map and graphed population trend for Redshank. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Dick Coombes).

Ireland's wintering Common Redshank (hereafter Redshank) are mainly from two populations, *robusta* which breeds in Iceland and the Faeroe Islands, and *totanus* which breeds in Britain and Ireland (Delany *et al.*, 2009). Both populations are exhibiting a decline at flyway level (Wetlands International, 2018). Note the proportion of *totanus* wintering in Ireland is unknown.

The overall numbers of this wader wintering in Ireland have shown an increasing trend since I-WeBS began, with the greatest increase observed during the earlier seasons, between 1994/95 and 2004/05. However numbers have dipped since the mid-2000s which has resulted in a short-term decline.

Redshank are predominantly coastally distributed in Ireland and were recorded at 133 sites during the current period (2011/12 – 2015/16). Despite the 1% international threshold for Redshank having decreased from 3,900 to 2,400 since the last period (Boland & Crowe, 2012), there are no longer any sites in the Republic of Ireland where numbers exceed the international threshold for this species. The three most important sites for Redshank are Lough Swilly, Dublin Bay and Dundalk Bay, consistent with the former period with just some small changes in their rank. However, while the five-year mean for Lough Swilly and Dublin Bay are relatively consistent with the former period, the current five-year mean for Dundalk Bay suggests numbers have declined at this site.

A total of 23 sites supported numbers of national importance based on the most recent five-year mean, including eight sites that were not of significant importance for Redshank during the former period (2001/02 and 2008/09). The two cross-border site, Lough Foyle and Carlingford Lough, both support Redshanks in numbers of national importance.

Table 63 Table showing sites supporting nationally important numbers of Redshank ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Lough Swilly	2,127	2,094	2,455	1,765	1,825	2,707	1,838	2,118	2,707	Sep, Jan
Dublin Bay	2,639	2,790	2,509	2,077	2,460	1,889	1,648	2,117	2,509	Sep
Dundalk Bay	4,532	1,745	1,317	1,995	1,485	1,588	2,057	1,688	2,057	Oct, Mar
Cork Harbour	1,365*	1,673*	1,352	1,739	1,436	1,906	1,542	1,595	1,906	Oct
Rogerstown Estuary	987	378	1,104	689	844	945	1,007	918	1,104	
Dungarvan Harbour	1,023	802	604	958	1,126	1,042	697	885	1,126	Nov, Dec
Lough Foyle †	1,305	495	1,001	624	1,068	735	890	864	1,068	
Castlemaine Harbour & Rossbehy [1]	383*	651	413	854	817	968	766	764	968	Oct
Carlingford Lough †	801	608	919	659	481	685	570	663	919	
Inner Galway Bay	624	507	902	451	688	785	480	661	902	Nov
Boyne Estuary	590	453	277	411	501	486	552	445	552	Sep, Mar
The Cull & Killag (Ballyteige) [1]	308	182	334	297	448	516	518	423	518	Sep
Ballysadare Bay	97	206	208	154	306	880	277	365	880	Feb
Wexford Harbour & Slobs [1]	80*	42*	273	457	276	595	215	363	595	Nov
Tralee Bay, Lough Gill & Akeragh Lough	496	1039	605	666	166	103	183	345	666	Nov
Blackwater	431	583*	338	435	331	288	265	331	435	Oct

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Estuary										
Sligo Harbour	376	131	103	340	309	695	184	326	695	Feb
Clonakilty Bay [1]	262	404	251	278	324	392	339	317	392	Oct
Clew Bay	314	477	345	296	258	257	310	293	345	Oct
Tramore Back Strand [1]	50*	99	79	205*	434	307		273	434	Feb
Ballymacoda [1]	168*	258*	188	344		284	252*	272	344	
Killala Bay [1]	41	310	200	207	138	486	251	256	486	Sep
Bandon Estuary [1]					249			249	249	
Sites no longer supporting numbers of national importance										
Shannon & Fergus Estuary [4]	174	290	230	245				238	245	
Broadmeadow (Malahide) Estuary	459	364	87	374	171	130	363	225	374	Oct
Baldoyle Bay	284				144	152	125	140	152	Sep, Jan, Mar

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

[4]Aerial census data.

4.64 Turnstone *Arenaria interpres* Piardálaí trá

interpres, N.E. Canada, Greenland (br)

International threshold:	1,400	**Population change (%):**	
All-Ireland threshold:	95	5 year:	-31.2
Population size (2011 – 2016):		12 year:	-31.3
All-Ireland	9,480	22 year:	-21.0
ROI	6,296	Historical:	-
Associated with ROI SPA network	2,352	Average annual change	+0.3

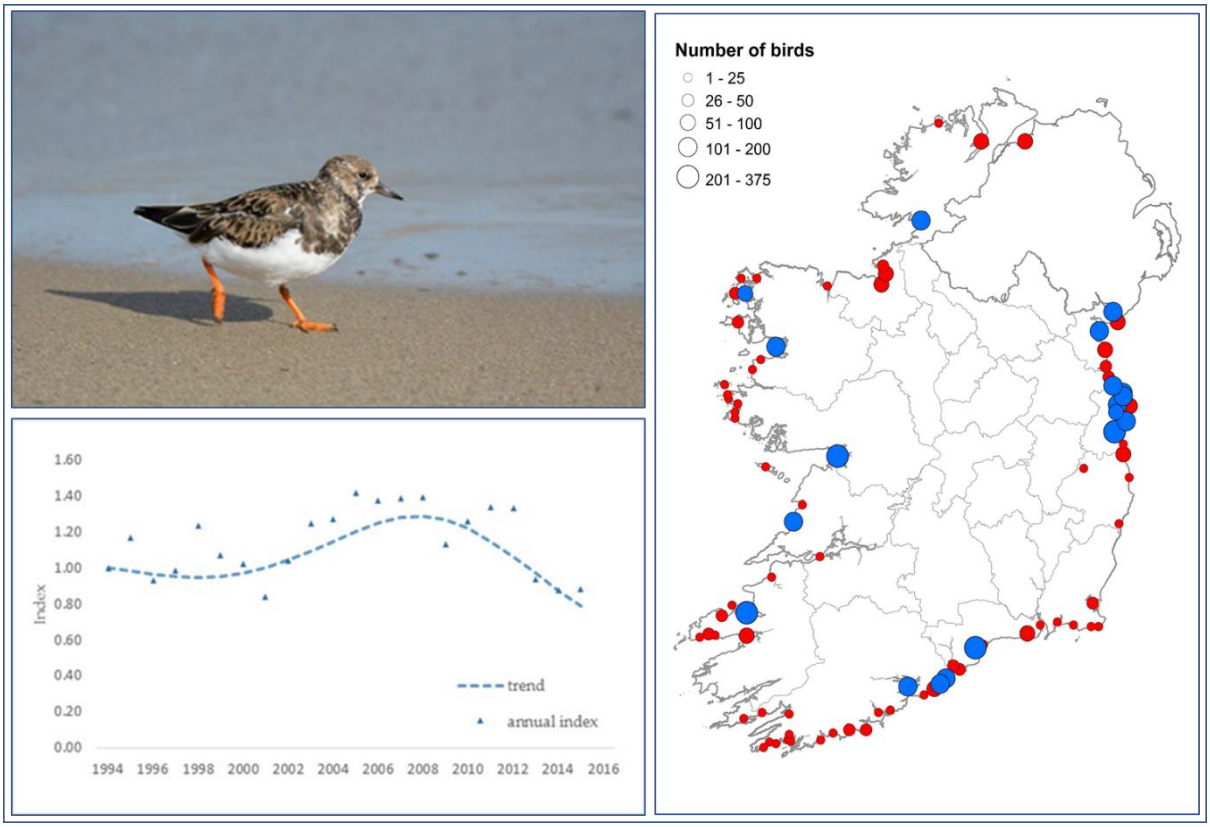


Figure 65 Distribution map and graphed population trend for Turnstone. The distribution map illustrates sites supporting numbers of national (all-Ireland) importance (blue circles), and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles). The population trend (1994/95 to 2015/16) graph illustrates the annual indices (triangles) together with the smoothed trend (hatched line) (Photo: Brian Burke).

Ireland's wintering Ruddy Turnstone (hereafter Turnstone) originate from a nominate population breeding in north-eastern Canada and northern and eastern Greenland whose non-breeding range extends across coastal western Europe with some birds reaching west Africa. This population is thought to be increasing (Wetlands International, 2018). In Britain, Turnstone numbers have been in decline since the 1990s (Frost *et al*., 2018) while in Ireland, numbers exhibited an increase from the early 2000s but have declined markedly since 2008, with the index in 2015/16 being the lowest in the long-term dataset.

Turnstone are specialists of rocky shores and open coasts, and Lewis *et al*. (2017) estimated that 48% of birds occur in this habitat in Ireland. It is therefore important to note that the trends presented here are based solely on I-WeBS core counts which monitors only a small proportion of non-estuarine coastline, and these trends should therefore be treated with some caution.

Turnstone are entirely coastally distributed in Ireland and were recorded at 88 sites during the current period 2011/12 – 2015/16. A total of 19 sites supported numbers of national importance, including seven sites that were not of significant importance during the former period (2001/02 and 2008/09). Consistent with the former period, Dublin Bay, Inner Galway Bay, Tralee Bay, Lough Gill and Akeragh Lough and Dungarvan Harbour are the key sites in the Republic ranked by mean number, while the cross-border site Carlingford Lough continues to support numbers of national importance (Table 64).

Table 64 Table showing sites supporting nationally important numbers of Turnstone ranked by the mean of peak counts between 2011/12 and 2015/16, and sites that are no longer of significant importance when compared with the 2001/02 – 2008/09 period.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites supporting numbers of national importance										
Dublin Bay	329	392	349	227	466	250	584	375	584	Oct
Inner Galway Bay	222	246	393	393	183	182	155	261	393	Nov, Jan
Tralee Bay, Lough Gill & Akeragh Lough	202	315	213	265	93	385	162	224	385	Jan
Dungarvan Harbour	149	300	106	264	217	247	199	207	264	Jan
Skerries Islands					240		140	190	240	Jan, Feb
Rogerstown Estuary	81	95	176	224	207	110	223	188	224	Oct
Dundalk Bay	178	105	107	221	259	120	207	183	259	Dec
Skerries Coast	84*	184	173	134	198	183	211	180	211	Oct, Nov
Mid-Clare Coast (Mal Bay - Doonbeg Bay) [1]	203	57	60	287	88*	116*	163	170	287	
Ballymacoda [1]	25*	73*	182	148		174	2*	168	182	Oct
Carlingford Lough †	150	124	118	141	114	202	164	148	202	
Cork Harbour	136*	176*	207	177	104	89	109	137	207	Feb
Clew Bay [1]	99	122	177	162	75	77	91	116	177	Nov, Dec
Delvin River - Hampton Cove [1]				133	141	22	166	116	166	
Ireland's Eye [1]					80	20*	150	115	150	
Ballycrenane/Warren [1]						148	78	113	148	
Donegal Bay	103	155	102	115	121	92	97	105	121	Feb

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Broadmeadow (Malahide) Estuary	175	175	23	221	94	85	75	100	221	Oct
Blacksod & Tullaghan Bays [1]	153	102*	151	103	71	101	57	97	151	Nov

Sites that supported numbers of national importance during the former period but no data were available for the current period: Ballagan Point – Cooley Point.

* Low-quality count not included in the calculation of the mean.

† Data provided by the UK (WeBS).

[1]Site not of significant importance during the former period, between 2001/02 and 2008/09.

4.65 Little Gull *Hydrocoloeus minutus* Sléibhín beag

C. & E. Europe (br)

Localised, largely pelagic in winter

International threshold: 1,000

Mean/ Peak (2011/12 – 2015/16): 9/25

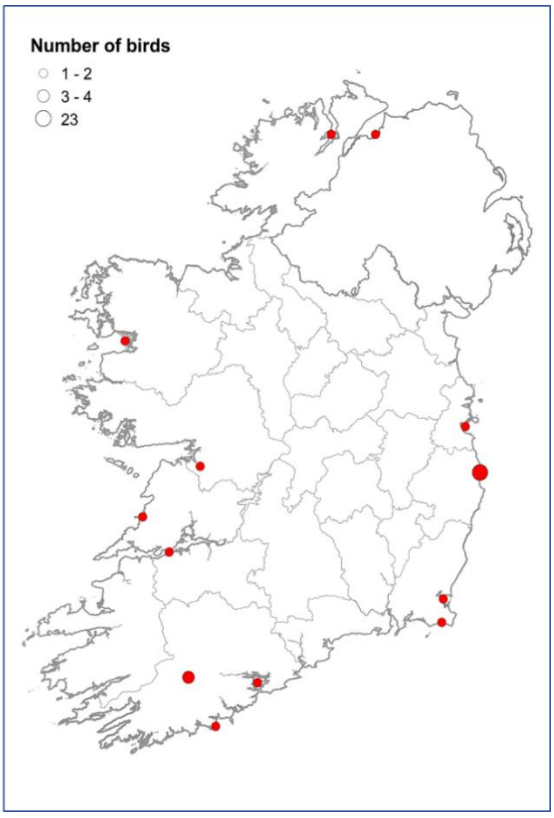


Figure 66 Distribution map for Little Gull showing peak counts (2011/12 – 2015/16) (Photo: Brian Burke).

Little Gull from the north, east and central European breeding population (North Scandinavia, Baltic states, West Russia, Belarus, and Ukraine) occur in Irish waters during winter. Many are moving through on passage to wintering grounds in south-west Europe, the Mediterranean and north-west Africa, but small numbers over-winter here. It is not possible to determine a trend for Little Gull in Ireland based on I-WeBS data, due both to the fact that counting gulls is optional and that Little Gull are predominantly pelagic so often won't be seen from the coast. At-sea seabird surveys have recorded several hundred individuals along the shallow banks in the Irish Sea. Large numbers (tens to hundreds) can be recorded in bays along the Dublin and Wicklow coasts when stormy weather and easterly/south-easterly winds force them to take shelter ashore (e.g. Milne, 2004; R. Coombes *pers. comm.).*

Little Gull continue to be most frequently recorded by counters at North Wicklow Coastal Marshes, including a peak count of 23 birds in 2014/15. The species was recorded at a total of 13 sites during the current period (2011/12 – 2015/16).

Table 65 Table showing sites that supported Little Gull in five or more seasons between 2009/10 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15
North Wicklow Coastal Marshes	4	2			3	23	2	6	23

Other sites recorded in less than five seasons (peak count):

Cahermore Turlough (1), Clew Bay (1), Cork Harbour (1), Courtmacsherry Bay, Broadstrand Bay & Dunworley (1), Dublin Bay (1), Inishcarra Reservoirs (4), Lough Foyle (NI) (1), Lough Swilly (1), Mid-Clare Coast (Mal Bay - Doonbeg Bay) (1), Shannon & Fergus Estuary (2), Tacumshin Lake (2), Tralee Bay, Wexford Harbour & Slobs (1).

4.66 Mediterranean Gull *Larus melanocephalus* Sléibhín meánmhuirí

W. Europe, Mediterranean & N.W. Africa (br)

International threshold: 2,400

Mean/ Peak (2011/12 – 2015/16): 229/439

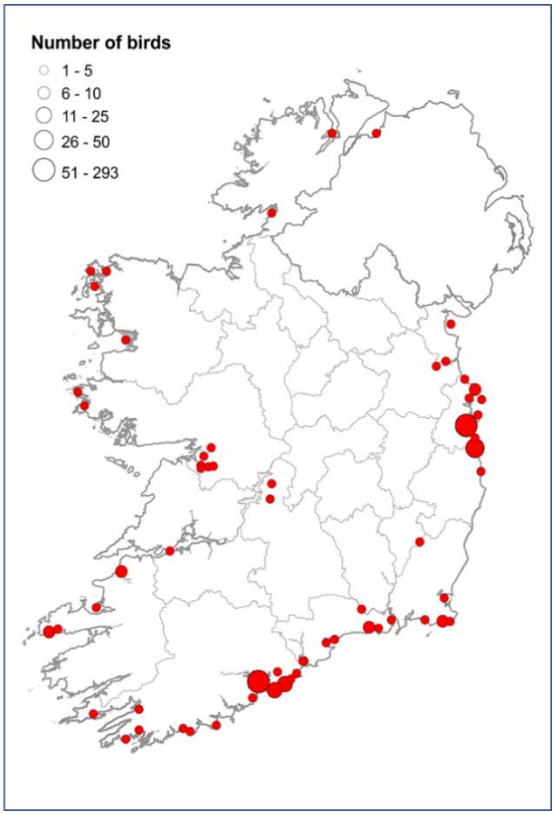


Figure 67 Distribution map for Mediterranean Gull showing peak counts (2011/12 – 2015/16) (Photo: Brian Burke).

Just one population of Mediterranean Gull has been identified, with its breeding range stretching from Azerbaijan in the east, with significant numbers on the Black Sea, and scattered breeding through central, south and western Europe (Wetlands International, 2018). The population size and range has been expanding from the core around the Black Sea since the 1950s (Mitchell *et al*., 2004). Numbers in the UK have increased significantly since Seabird 2000, with *c*.800 pairs in recent years and an unexpectedly rapid increase to 1,736 pairs at the Langstone Harbour (Portsmouth) colony in 2018.

Mediterranean Gull began breeding in Ireland in 1995 and are now firmly established at Lady's Island Lake in Wexford, with a peak of 72 pairs breeding in 2016 (Daly *et al*., 2016) and 49 pairs in 2018 (Daly *et al*., 2018) and one or two pairs have been recorded breeding at gull colonies elsewhere in the midlands and west (Perry, 2013; Newton, 2017). Small numbers (total of eight pairs in 2018; Booth Jones & Wolsey, 2018) have bred annually at two to four sites in Northern Ireland in recent years.

As breeding numbers of Mediterranean Gull in this part of their range have increased in the last 20+ years, so too have their wintering numbers. They were recorded at 61 sites during the current period (2011/12 – 2015-16), in contrast to 44 sites during the former period. Although recording gulls during I-WeBS counts is optional, comparisons of sites that have consistently opted to do so illustrates the scale of the change over that period. Numbers in Dublin Bay have gone from a peak of seven individuals during the 1996/97-2000/01 period (Crowe, 2005) to 70 individuals between 2001/02 and

2008/09 (Boland & Crowe, 2012), with a maximum count of 293 in 2015/16. Similarly, mean numbers in Dublin Bay increased from 33 in the former period to 99 in the current period. Such increases are also evident at Cork Harbour, where a peak of seven birds was recorded between 1996/97 and 2000/01, which rose to a peak of 146 in the recent period, with a doubling of the mean numbers between the former and current period also. There is, therefore, undoubtedly an increase in wintering Mediterranean Gull in Ireland in recent years, although it is not possible to quantify the extent of that increase or number of the wintering population here. Mediterranean Gull were recorded at 60 during the current period, an increase from 45 sites during the former period.

Table 66 Table showing sites that supported Mediterranean Gull in five or more seasons between 2009/10 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15
Dublin Bay	27	101	113	23	39	27	293	99	293
Cork Harbour	21	52	8	43	72	146	97	73	146
Ballycotton Shanagarry	1	1	3	14			1	4	14
Broadhaven & Sruwadaccon Bays	1		4	1	1	4		3	4
Ventry Harbour	10	3	1	2	9		1	3	9
Blacksod & Tullaghan Bays	1	1	1	1	2	5		2	5
Lough Foyle†	4	1	1	3	1	1	5	2	5
Mannin Bay	4	3	1	2	1	2	1	1	2
North Wicklow Coastal Marshes	1		1	1	1	1	2	1	2

† Data provided by the UK (WeBS).

Other sites recorded in less than five seasons (peak count):

Ballinduff Turlough & Grassland (1), Ballybranagan (19), Ballycrenane/Warren (1), Ballydehob Estuary (2), Ballymacoda (5), Ballyshunnock Reservoir (10), Bantry Bay (1), Bear Haven (5), Blackwater Estuary (2), Bray Harbour (50), Caherglassaun Lough (1), Cahermore Turlough (1), Cashen River & Estuary (6), Clew Bay (1), Clonea Strand (1), Courtmacsherry Bay, Broadstrand Bay & Dunworley (2), Croagh Bay (1), Delvin River - Hampton Cove (1), Dingle Harbour (1), Donegal Bay (1), Dundalk Bay (1), Dungarvan Harbour (1), Ireland's Eye (1), Kilkeran Lake (2), Killineer Quarry, Drogheda (1), Kiltiernan Turlough (1), L. Coy - Blackrock - Bullaunagh – Ballylee (1), Lady's Island Lake (3), Lambay Island (1), Lough Aderry (1), Lough Eorna (1), Lough Swilly (1), Lower Blackwater River (1), Omey Strand (1), Pat Reddan's Lake (3), Rahasane Turlough (1), Ringabella Creek (1), River Boyne (5), River Suir Lower (1), Rogerstown Estuary (1), Rosscarbery (2), Shannon & Fergus Estuary (1), Skerries Coast (7), Slaney Upper (2), South Dublin Coastline (1), Tacumshin Lake (8), Termoncarragh & Annagh Marsh (1), The Cull & Killag (Ballyteige) (1), Tralee Bay, Lough Gill & Akeragh Lough (5), Tramore Back Strand (1), Waterford Harbour (1), Wexford Harbour & Slobs (1).

4.67 Black-headed Gull *Larus ridibundus* Sléibhín

W Europe (br)

International threshold: 31,000

All-Ireland threshold: -

Mean/Peak (2011/12 – 2015/16): 48,821/57,892

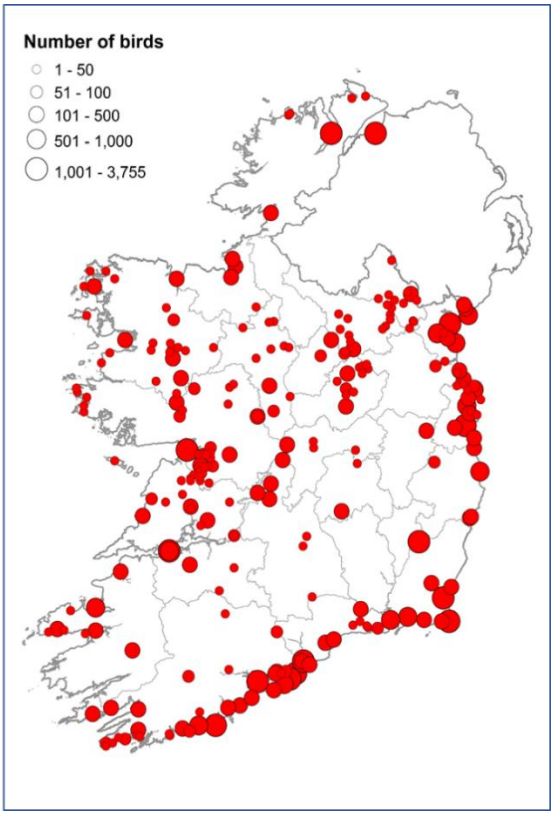


Figure 68 Distribution map for Black-headed Gull showing all sites where recorded during the period between 2011/12 and 2015/16 (red circles) (Photo: Brian Burke).

The Black-headed Gull is our most widespread and numerous wintering gull, being found regularly on inland and coastal wetlands throughout the winter. As with other gull species, the fact that recording gulls is optional during I-WeBS counts means we cannot draw any firm conclusions as to their trends or total numbers here during the winter. In addition, this species often feeds away from wetland sites. Based on colour-ring resightings, the Irish wintering population is likely comprised of a mix of Irish-breeding birds as well as individuals from the UK, Scandinavia and Baltic states (Wernham *et al*., 2002). Most Irish-breeding Black-headed Gull remain here throughout the year but a small proportion of predominantly juvenile birds move south to Europe or north Africa (Wernham *et al*., 2002; McGreal, 2014). A survey of breeding gulls in Ireland was completed in 2018, the results of which are pending, that will provide an indication of the population trajectory since Seabird 2000. The North & West European population is thought to be stable or declining (Wetlands International, 2018) and the UK breeding population is thought to have increased in recent years (JNCC, 2018).

A comparison of totals between the current and former period (2004/05-2008/09) shows increases of over 25,000 on both the mean and peak figures of Black-headed Gull. The number of sites at which they were recorded has increased from 228 during the former period, to 247 for the current period (2011/12 – 2015/16) which is more likely a reflection of increased survey effort rather than increased

occurrence or expansion of range. Some 13 sites regularly supported over 1,000 individuals while four sites dropped below 1,000 individuals since the former period.

Table 67 Table showing sites that supported Black-headed Gull in five or more seasons between 2009/10 and 2015/16 with an average 1,000 individuals or more between 2011/12 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Sites regularly supporting 1,000 individuals or more										
Lough Foyle †	2,573	2,266	5,293	3,201	4,023	4,085	2,172	3,755	5,293	
Cork Harbour	466	5,357	3,790	1,814	3,275	4,289	3,878	3,409	4,289	
Inner Galway Bay	2,302	3,200	2,115	2,360	2,207	7,672	1,185	3,108	7,672	Jan
Shannon & Fergus Estuary[4]			1,377	4,661				3,019	4,661	
Lough Swilly	1,301	1,426	3,078	1,840	3,044	2,883	1,345	2,438	3,078	Feb
Dublin Bay	2,234	2,356	2,269	1,622	2,649	1259	2,768	2,113	2,768	Sep, Jan
Dundalk Bay	5,066	4,362	5,047	1,148	2,041	1,295	680	2,042	5,047	Sep
Lady's Island Lake	1,100	1,584	1,270	1,266	2,478	1,040	2,425	1,696	2,478	
Wexford Harbour & Slobs [1]	3,992	705	2,455	1,156	632	1,780	1,239	1,452	2,455	Feb
Courtmacsherry Bay, Broadstrand Bay & Dunworley	1,222	1,134	1,379	654	1,421	2,090	1,318	1,372	2,,090	Sep, Oct
Ballymacoda [1]	115	629	880	1,920		1,105	665*	1,302	1,920	Sep, Nov
Ballycrenane/Warren[1]						1,390	673	1,032	1,390	
Blackwater Estuary	4,442	350	2,300	762	817	705	530	1,023	2,300	Sep, Jan
Sites where numbers have dropped below 1,000 individuals since the former period										
Tralee Bay, Lough Gill & Akeragh Lough	1,322	1,128	2,071	2,064	20	250	61	893	2,071	
Broadmeadow (Malahide) Estuary	930	565	845	368	659	571	496	588	659	
River Slaney	12		117	291				204	291	

Sites that supported numbers of national importance during the former period but no data were available for the current period: North Wexford Coast.

* Low-quality count not included in the calculation of the mean.

[1]Site not of significant importance during the former period (2001/02 and 2008/09), in that less than 1,000 individuals were recorded.

† Data provided by the UK (WeBS).

4.68 Common Gull *Larus canus* Faoileán bán

canus, N. W. & C Europe (br)

International threshold: 16,400

All-Ireland threshold: -

Mean/ Peak (2011/12 – 2015/16): 21,438/30,216

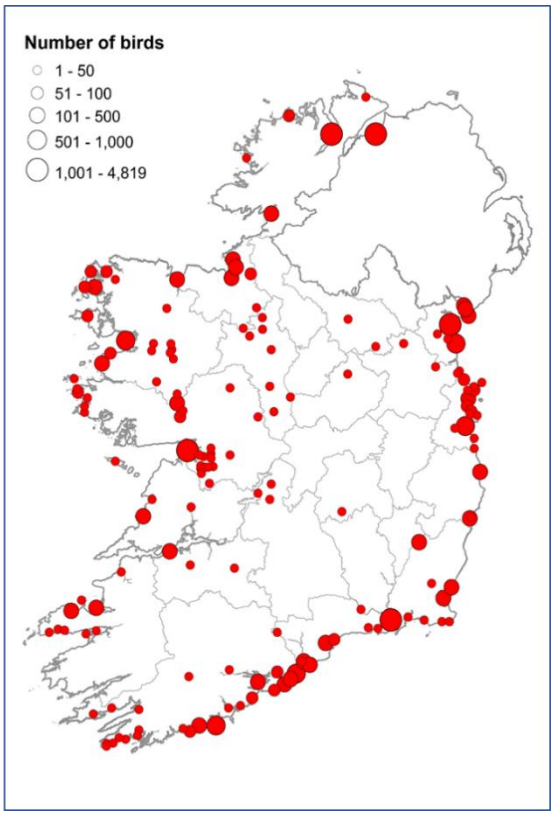


Figure 69 Distribution map for Common Gull showing all sites where recorded during the period between 2011/12 and 2015/16 (red circles) (Photo: Brian Burke).

The nominate form of the Common Gull (or Mew Gull) breeds in Iceland, the Faroes, Ireland, Britain, France, Belgium, the Netherlands, Scandinavia and the Baltic States as far east as the White Sea. Common Gull are migrants or partial migrants, with birds from Scandinavia and Europe shifting to the south and west towards Ireland, Britain and the Bay of Biscay (Wernham *et al*., 2002). Irish-breeding Common Gull are partial migrants (Radford, 1960; Wernham *et al*., 2002; McGreal, 2014). Of 69 colour-ringed Common Gull resighted away from their Lough Mask colony, there were 148 resightings in total from 2006 to 2013, all of which occurred in Ireland and most of which were along the South Galway and Clare coastline (McGreal, 2014). This indicates a strong dispersal bias towards the south/southwest, in agreement with Radford (1960).

The All-Ireland breeding population was estimated at 1,600 pairs from 1999-2002 (Mitchell *et al*., 2004), and a peak of over 11,000 individuals was recorded during I-WeBS counts in the early 2000s (Boland & Crowe, 2012). This indicates a significant influx of individuals in the winter, particularly given the fact that recording gulls is optional in I-WeBS so the latter figure is undoubtedly an underestimate.

Common Gull were recorded at 160 sites during the current period (2011/12 – 2015/16). The five-year mean and peak numbers of Common Gull were over double those recorded for the former period. Although comparisons of I-WeBS gull numbers should be done with much caution, the fact that Common Gull were recorded at the same number of sites as in the former period, and Ballymacoda is the only 'new' site to hold >500 individuals on a regular basis, this suggests that there may be a true increase in wintering numbers in recent years. Winter gull roost surveys in the UK have found significant increases in the English wintering population (minimum estimates) in recent decades, with declines in Scotland, Wales and Northern Ireland.

Table 68 Table showing sites that supported Common Gull in five or more seasons between 2009/10 and 2015/16 with an average 500 individuals or more between 2011/12 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Lough Foyle †	2,513	1,754	7,225	3,032	7,756	2,124	3,957	4,819	7,756	
Lough Swilly	3,087	1,048	3,899	1,879	1,363	1,141	938	1,844	3,899	
Dundalk Bay	3,208	1,496	2,855	2,276	1,193	894	752	1,594	2,855	Jan
Waterford Harbour			1,271		1,200			1,236	1,271	
Inner Galway Bay	1,458	1,272	1,717	1,697	846	1,432	381	1,215	1,717	Nov, Jan
Courtmacsherry Bay, Broadstrand Bay & Dunworley	465	347	389	383	2,459	655	321	841	2,459	Dec, Feb
Clew Bay	205	1,067	621	370	723	785	435	587	785	Feb
Ballymacoda [1]	326	418	275	1,300		344	387	577	1,300	Sep
Dublin Bay	579	573	410	309	985	272	890	573	985	
Dunany Point – Clogher Head	1,660	452	960	300	9*		386	549	960	Sep
Sites where numbers have dropped below 500 individuals since the former period										
Blackwater Estuary	557	167	1,200	461	239	244	150	459	712	Jan
Ballycotton Shanagarry	1,204	293	375	210	531	258	168	308	531	

Sites that supported numbers of national importance during the former period but no data were available for the current period: Clogher Head – Baltray; North Wexford Coast.

* Low-quality count not included in the calculation of the mean.

[1]Site not of significant importance during the former period (2001/02 and 2008/09), in that less than 500 individuals were recorded.

† Data provided by the UK (WeBS).

4.69 Ring-billed Gull *Larus delawarensis* Faoileán bandghobach

N. America (br)

Scarce winter visitor

International threshold: 25,500

Mean/ Peak (2011/12 – 2015/16): 9/14

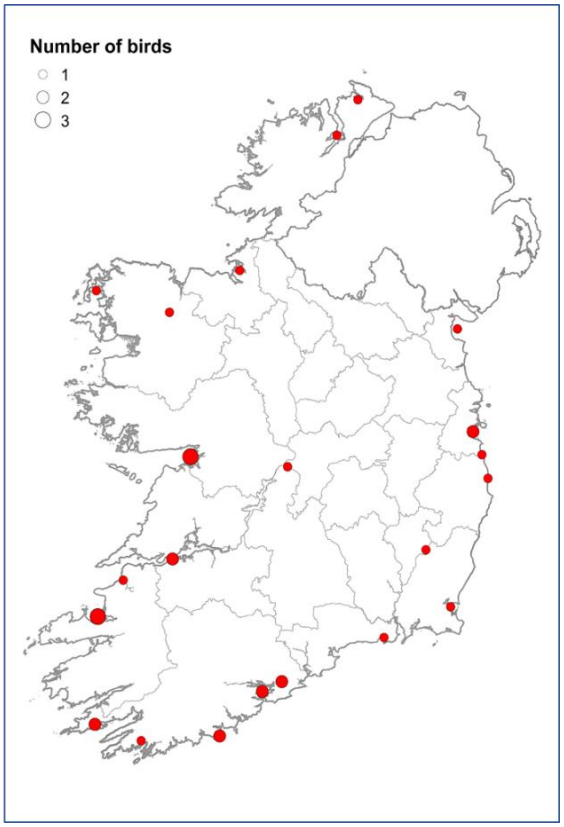


Figure 70 Distribution map for Ring-billed Gull showing peak counts (2011/12 – 2015/16) (Photo: Brian Burke).

The Ring-billed Gull is common in North America and generally winters is in the southern United States and around the Gulf of Mexico. It is the most common Nearctic gull that appears as a vagrant in Europe. The first Ring-billed Gull in Ireland were recorded in 1979 in the Belmullet area, and they have since become a regular occurrence at many sites in the north and west throughout the winter. They were recorded at 22 I-WeBS sites during the current period, usually as single birds but occasionally as two or three individuals. As with other gulls, the fact that counts of this group aren't mandatory means they are undoubtedly under-recorded. As with other vagrant gulls they are also probably misidentified during counts to some extent and are liable to be confused with Common Gull at a distance or by unfamiliar counters. The number of sites and mean/peak numbers have not varied much throughout I-WeBS, with peak counts of 10-16 birds and records from 23-28 sites across the three periods analysed (Crowe, 2005; Boland & Crowe, 2012).

Table 69 Table showing sites that supported Ring-billed Gull in five or more seasons between 2009/10 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15
Inner Galway Bay	1	1		1	2	3	1	1	3
Shannon & Fergus Estuary	2	2	2	1	2	2		1	2
Cork Harbour		1	2		1	1	1	1	2

Other sites recorded in less than five seasons (peak count):

Ballydehob Estuary (1), Bear Haven (2), Blacksod & Tullaghan Bays (1), Bray Harbour (1), Cashen River & Estuary (1), Courtmacsherry Bay, Broadstrand Bay & Dunworley (2), Dublin Bay (2), Dundalk Bay (1), Little Brosna Callows (1), Lough Aderry (1), Lough Conn (1), Lough Swilly (1), North Wicklow Coastal Marshes (1), Slaney Upper (1), Sligo Harbour (1), Tralee Bay, Lough Gill & Akeragh Lough (3), Tramore Back Strand (1), Trawbreaga Bay (1), Wexford Harbour & Slobs (1).

4.70 Lesser Black-backed Gull *Larus fuscus* Droimneach beag

graellsii, W. Europe (br)[1]

intermedius S. Scandinavia (br)[2]

International threshold: 5,500[1] / 6,300[2]

All-Ireland threshold: -

Mean/ Peak (2011/12 – 2015/16): 11,842/ 20,832

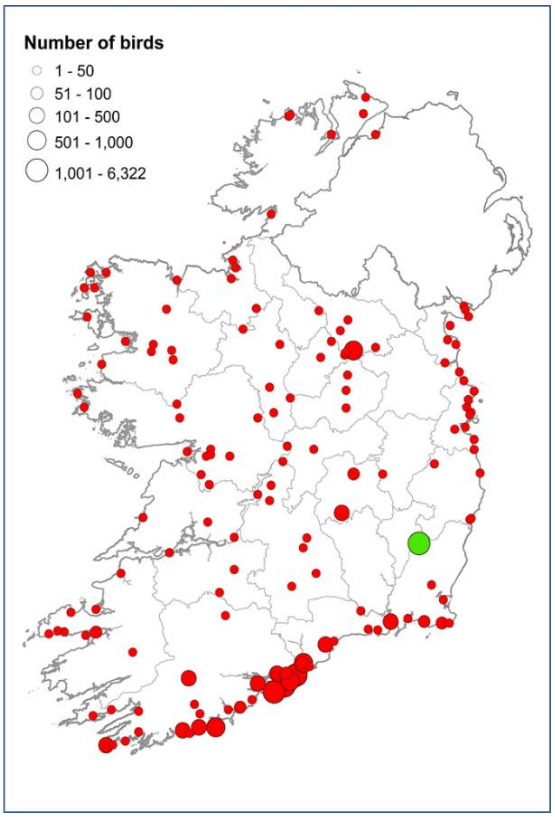


Figure 71 Distribution map for Lesser Black-backed Gull showing sites of international importance (green circles) and all other sites where recorded during the period between 2011/12 and 2015/16 (red circles) (Photo: Brian Burke).

Lesser Black-backed Gull that winter in Ireland consist of both the *graellsii* (breeds in south-west Greenland, Iceland, the Faeroes, Ireland, Britain, Belgium and France) and *intermedius* (breeds in S Scandinavia and central Europe) subspecies (Wernham *et al*., 2002). The trend for non-breeding (wintering) birds in Ireland remains uncertain as counts of gulls during I-WeBS are optional.

Lesser Black-backed Gull were recorded at 147 sites during the current period and nine sites supported over 200 individuals (mean peak 2011/12- 2015/16), most of which recorded peak numbers in autumn and spring which will have consisted largely of roosting individuals gathering pre- and post-migration. Other sites recorded several hundred Lesser Black-backed Gull in mid-winter however, and wintering numbers have undoubtedly increased since the middle of the last century (Hutchinson, 1989). Ballymacoda, Ballycotton Shanagarry and the Blackwater Estuary remain key sites, although numbers at the latter have now dropped below the international threshold.

Lesser Black-backed Gull show a contraction in breeding and wintering range with age, with adult birds wintering closer to the breeding grounds than younger individuals (Ross-Smith *et al*., 2015). Colour ringing schemes throughout their range have provided information on the breeding, migratory and wintering behaviours of all three races of Lesser Black-backed Gull (Ross-Smith *et al*., 2015). Recent colour-ringing projects at Irish breeding colonies on Lough Mask, Lough Ree, at Cape Clear and in Dublin should provide similarly insightful information on the Irish population in the coming years.

Table 70 Table showing sites that supported Lesser Black-backed Gull in five or more seasons between 2009/10 and 2015/16 with an average 200 individuals or more

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Slaney Upper[1]						6,322		6,322	6,322	
Ballymacoda	15	367	2,100	6,100		4,960	351*	4,386	4,960	Sep
Ballycotton Shanagarry	2,250	619	1,035	3,037	1,277	2,210	773	1,666	3,037	Sep, Jan
Blackwater Estuary [3]	6,510	566	2,931	198	321	209	224	777	2,931	Jan
Courtmacsherry Bay, Broadstrand Bay & Dunworley	689	288	1,027	584	313	501	834	652	1,027	Sep, Mar
Lissagriffin Lake [1]			170	500	171	850	440	426	850	Feb
Dungarvan Harbour [1]	539	164	193	446	723	88	80	306	723	Nov
Clonakilty Bay [1]		109	151	47	562	175	220	231	562	Oct, Mar
Lough Aderry [1]	520	10	58	135	364	315	194	213	364	Oct
Sites where numbers have dropped below 200 individuals since the former period										
Waterford Harbour			29		255			142	255	
Dublin Bay	19	195	28	25	5	20	16	19	28	Feb
Cork Harbour	60	299	72	167	120	142	162	133	167	Sep

* Low-quality count not included in the calculation of the mean.

[1]Site not of significant importance during the former period (2001/02 and 2008/09).

[3]Site demoted (from supporting numbers of international importance) since the 2001/02 to 2008/09 period.

4.71 Herring Gull *Larus argentatus* Faoileán scadán

argentatus, N. & N.W. Europe (br)

International threshold: 14,400

All-Ireland threshold: -

Mean/ Peak (2011/12 – 2015/16): 11,524/ 13,959

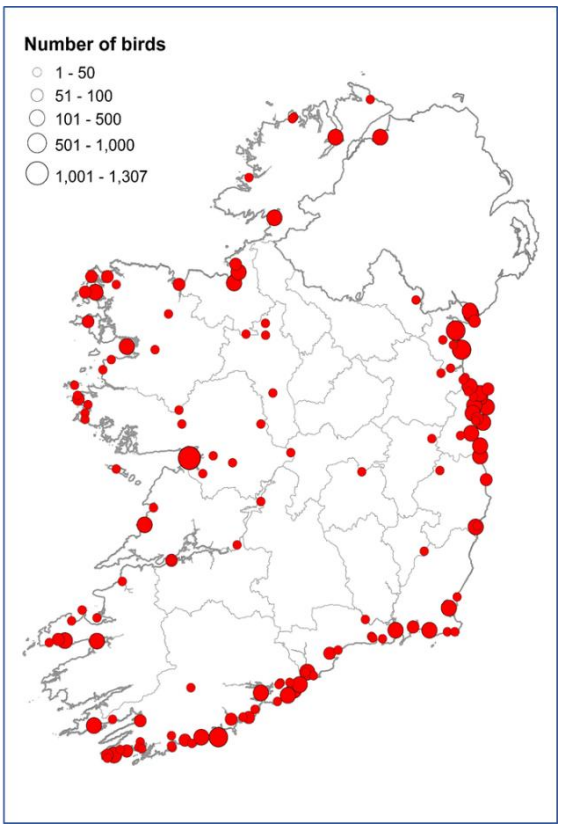


Figure 72 Distribution map for Herring Gull showing all sites where recorded during the period between 2011/12 and 2015/16 (red circles) (Photo: Brian Burke).

The north-west European population of Herring Gull continues to decline (Wetlands International, 2018). As counts of gulls during I-WeBS are optional, it is not possible to ascertain the true numbers or trends of the wintering population. However, the mean and peak numbers of Herring Gull recorded each year during I-WeBS have increased since the previous period (Boland & Crowe, 2012), but this may be largely attributable to increased survey coverage. A census of breeding seabirds is currently ongoing in Ireland and the UK ('Seabirds Count' 2015-2018) which will provide an indication of how the breeding population is faring, although counting the increasing urban-nesting population is difficult. The majority of the Irish wintering population is thought to be comprised of Irish and UK birds (Wernham *et al*., 2002). The species remains red-listed as a breeding species in Ireland (Colhoun & Cummins, 2013) due to long-term declines in their breeding numbers and range.

Herring Gull are largely coastal in Ireland in both summer and winter, though recent rooftop-breeding at inland locations in Meath and Westmeath may lead to more regular use of inland sites during the winter in future years. Herring Gull were recorded at 138 sites during the current period. Of these, some 15 sites regularly supported over 200 Herring Gull from 2011/12 to 2015/16, with

another four supporting over 200 individuals in the years they were surveyed (refer to Table 71). Numbers counted vary significantly between months and years and it seems likely that even day to day variability in weather conditions, food availability and time of counts may influence the numbers recorded to some extent. Peak counts of over 2,000 Herring Gull were recorded at Inner Galway Bay, Dunany Point – Clogher Head, Courtmacsherry Bay, and Dundalk Bay. Numbers in Dublin Bay averaged almost 400 birds, with a peak count of over 500 in 2015/16. Over 3,000 Herring Gull were recorded during a targeted gull roost survey in Dublin Bay that winter (H. Boland *pers. comm.*), highlighting the inadequacy of I-WeBS core counts to accurately document true numbers and site importance for this species group.

Table 71 Table showing sites that supported Herring Gull in five or more seasons between 2009/10 and 2015/16 with an average 200 individuals or more between 2011/12 and 2015/16

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Inner Galway Bay	688	617	850	504	767	3,833	582	1,307	3,833	Jan, Mar
Dunany Point - Clogher Head	200	505	805	446	192*		1171	807	1,171	Sep
Courtmacsherry Bay, Broadstrand Bay & Dunworley	363	138	237	166	2,008	892	229	706	2,008	Oct
Dundalk Bay	743	888	2,300	329	407	204	269	702	2,300	Oct
Bear Haven [1]	745		72	222*	520	891	165	412	891	Feb
Lambay Island					300		500	400	300	
Lough Swilly	272	195	201	193	148	613	833	398	833	Nov
Dublin Bay	422	341	519	135	490	261	538	389	538	Sep
Skerries Coast [1]	250	240	235	325	422	331	523	367	523	Sep, Oct
Lough Foyle †			511	481	271	139	425	365	511	
Rogerstown Estuary	596	45	739	189	237	300	332	359	739	Mar
Donegal Bay [1]	281	190	211	753	276	193	281	343	753	Oct
Ballysadare Bay [1]	117	258	200	25	176	505	641	309	641	Feb
Sligo Harbour [1]	168	221	215	137	252	383	210	239	383	Feb
Ballycotton Shanagarry	432	324	193	239	396	181	136	229	396	Sep
Other sites where species was recorded in less than five seasons but average number exceeded 200										
Ireland's Eye					300	200*	300	300	300	
Skerries Islands					250		340	295	340	Nov, Dec
Delvin River - Hampton Cove				220	410	239	296	291	410	Oct
Ballycrenane/Warren						325	180	253	325	
Sites where numbers have dropped below 200 individuals since the former period										
Blackwater Estuary			208	76	159	122	150	143	208	Sep, Dec
Avoca River/Arklow	187	145	139				133	136	139	

Sites that supported numbers of national importance during the former period but no data were available for the current period: Clogher Head – Baltray.

* Low-quality count not included in the calculation of the mean.

[1]Site not of significant importance during the former period (2001/02 and 2008/09).

† Data provided by the UK (WeBS).

4.72 Iceland Gull *Larus glaucoides* Faoiléan íoslannach

glaucoides, S. & W. Greenland (br)

Scarce winter visitor

International threshold: 2,100

Mean/ Peak (2011/12 – 2015/16): 23/ 63

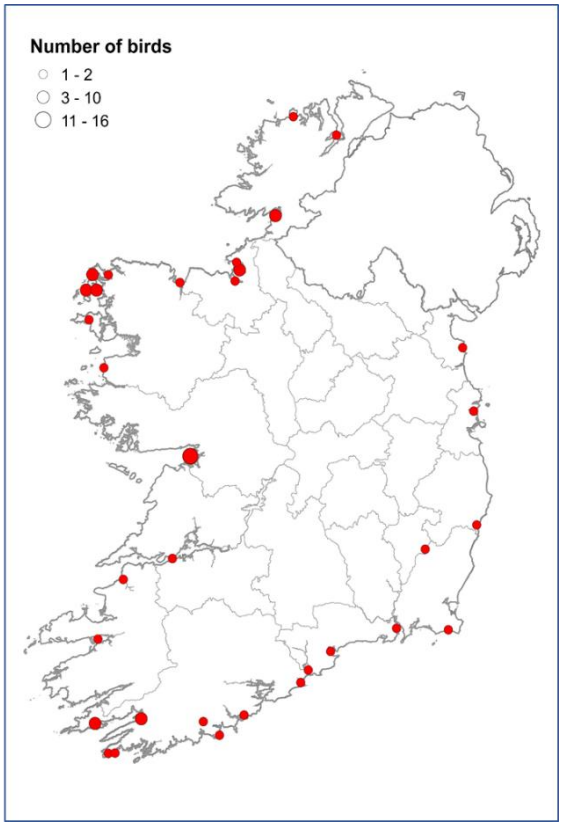


Figure 73 Distribution map for Iceland Gull showing peak counts (2011/12 – 2015/16) (Photo: Dick Coombes).

The nominate *glaucoides* population of Iceland Gull breeds in south and west Greenland and winters in northern and western Europe. The population is thought to be stable, but reliable data is lacking (Wetlands International, 2018). Iceland Gull are recorded in varying numbers at coastal sites in Ireland each winter, usually juvenile birds. Inner Galway Bay and Killybegs Harbour are the most reliable sites to see them each winter, though the latter has not been counted for I-WeBS in recent years. They were recorded at 34 sites during the current period but are likely to be under-recorded by observers not familiar with the species. Smaller numbers of the conspecific North American Kumlien's (*L. g. kumlieni*) race are recorded in Ireland annually and individuals of the North American Thayer's (*L. g. thayeri*) race also are also recorded here on occasion (Hobbs, 2016; Fahy, 2013).

Table 72 Table showing sites that supported Iceland Gull in five or more seasons between 2009/10 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15
Inner Galway Bay	1		16		2	1	1	4	16

Other sites recorded in less than five seasons (peak count 2011/12 – 2015/16):

Arklow Ponds (2), Avoca River/Arklow (1), Ballyconneely Bay (2), Ballymacoda (1), Ballysadare Bay (1), Bantry Bay (3), Bear Haven (8), Blacksod & Tullaghan Bays (1), Blackwater Estuary (1), Broadhaven & Sruwadaccon Bays (2), Broadmeadow (Malahide) Estuary (2), Cashen River & Estuary (2), Castlemaine Harbour & Rossbehy (1), Cork Harbour (1), Courtmacsherry Bay, Broadstrand Bay & Dunworley (1), Donegal Bay (8), Drumcliff Bay Estuary (3), Dungarvan Harbour (1), Killala Bay 1), Lissagriffin Lake (1), Lough Swilly (2), Madame Lake (Bateman's Lough) (1), Mid-Clare Coast (Mal Bay - Doonbeg Bay) (1), Mullet West (9), Shannon & Fergus Estuary (2), Slaney Upper (1), Sligo Harbour(3), South Mayo Coast (1), Stick Estuary (Oysterhaven) (1), Tacumshin Lake (1), Termoncarragh & Annagh Marsh (5), Waterford Harbour (1).

4.73 Glaucous Gull *Larus hyperboreus* Faoileán glas

hyperboreus, Svalbard & N. Russia (br)[1]

leuceretes, N. Canada to Greenland & Iceland (br)[2]

Scarce winter visitor

International threshold: 340[1]/3,100[2]

Mean/ Peak (2011/12 – 2015/16): 20/34

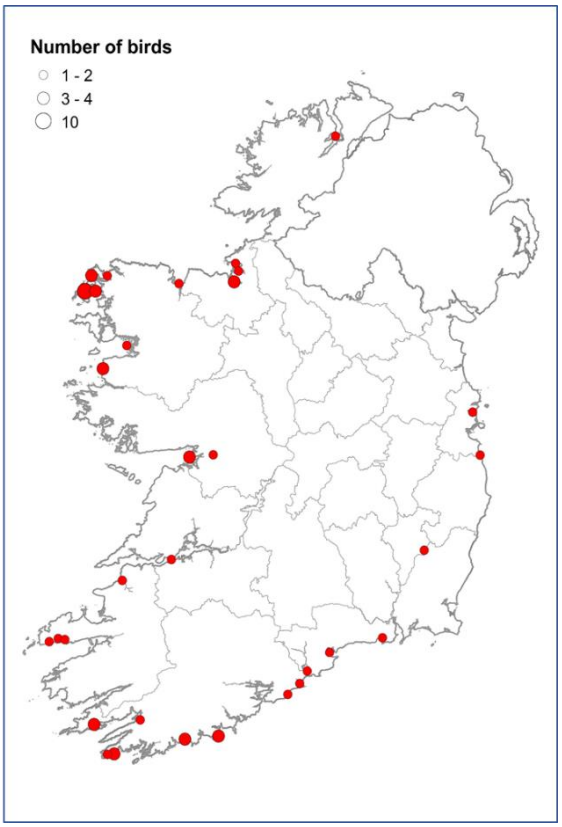


Figure 74 Distribution map for Glaucous Gull showing peak counts (2011/12 – 2015/16) (Photo: Brian Burke).

Glaucous Gull breed at northly lattitudes to the east (*hyperboreus*, Svalbard & N Russia) and west (*leuceretes*, Canada, Greenland & Iceland) of Ireland (Wetlands International, 2018). They occur annually in Ireland, though in very small numbers. Both populations are deemed to be stable, with possible increases in the *hyperboreus* population and possible decreases in the *leuceretes* population, though quality of estimates and trends is poor and based on best estimate (Wetlands International, 2018). As with Iceland Gull, the majority of Glaucous Gull recorded in Ireland tend to be juveniles and their distribution here is almost completely coastal. Glaucous Gull were recorded at 33 sites during the current period, although are likely to be under recorded.

Table 73 Table showing sites that supported Glaucous Gull in five or more seasons between 2009/10 and 2015/16.

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15
Termoncarragh & Annagh Marsh	1		4	3	4	1		3	4
Inner Galway Bay		1	3	2	1		1	1	3

Other sites recorded in less than five seasons (peak count 2011/12-2015/16):

An Trá Beg (1), Ballycotton Shanagarry (2), Ballymacoda (1), Ballysadare Bay (4), Bear Haven (4), Blacksod & Tullaghan Bays (3), Blackwater Estuary (2), Bray Harbour (1), Broadhaven & Sruwadaccon Bays (2), Cashen River & Estuary (1), Clew Bay (2), Courtmacsherry Bay, Broadstrand Bay & Dunworley (3), Crookhaven (3), Dingle Harbour (1), Drumcliff Bay Estuary (1), Dungarvan Harbour (1), Killala Bay (1), Lissagriffin Lake (1), Lough Swilly (2), Mullet West (10), Rahasane Turlough (1), Rosscarbery (3), Shannon & Fergus Estuary (1), Slaney Upper (1), Sligo Harbour (1), South Mayo Coast (3), Tramore Back Strand (1), Ventry Harbour (1).

4.74 Great Black-backed Gull *Larus marinus* Droimneach mór

N. & W. Europe (br)

International threshold: 3,600

All-Ireland threshold: -

Mean/ Peak (2011/12 – 2015/16): 4,010/4,392

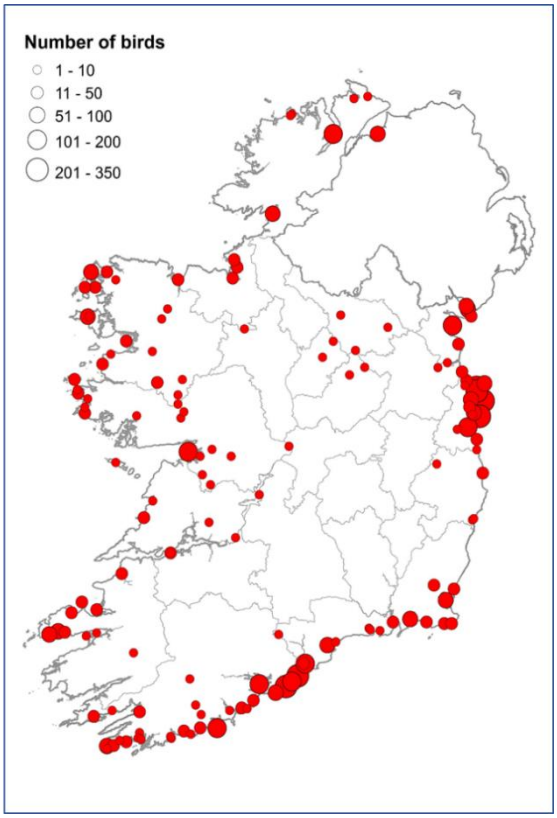


Figure 75 Distribution map for Great Black-backed Gull showing sites that supported an average one or more bird between 2011/12 and 2015/16 (Photo: Brian Burke).

The north and west European population of Great Black-backed Gull is thought to be declining (Wetlands International, 2018). Counting of gulls during I-WeBS is optional, and it is therefore not possible to estimate their wintering numbers in Ireland with any degree of accuracy. Their breeding numbers are currently being assessed under the 'Seabirds Count (2015-2018) survey, which should give some indication as to the health of the wintering population here given that Irish- and UK-breeding birds are thought to comprise the majority of our wintering population (Wernham *et al.*, 2002). Great Black-backed Gull is currently amber-listed as a species of conservation concern in Ireland due to moderate declines in breeding numbers and range (Colhoun & Cummins, 2013). Their breeding and wintering distribution is predominantly coastal.

Great Black-backed Gull were recorded at 144 sites during the current period, an increase of 16 sites on the former period. Fifteen sites were identified as regularly supporting 100 or more wintering individuals from 2011/12 to 2015/16. The importance of sites such as Lambay Island, Skerries Islands, Ireland's Eye and Rockabill suggest that large numbers of Great Black-backed Gull use offshore islands for roosting and resting during the winter.

Table 74 Table showing sites that supported Great Black-backed Gull in five or more seasons between 2009/10 and 2015/16 with an average 100 individuals or more between 2011/12 and 2015/16

Site	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Mean 11-15	Peak 11-15	Month(s)
Lambay Island[1]					300		400	350	400	
Ballymacoda[1]	72	506	268	382		315	127*	322	382	
Skerries Islands					100		370	235	370	
Skerries Coast[1]	179	133	210	263	128	145	403	230	403	
Ballycotton Shanagarry	400	381	118	172	264	425	165	229	425	
Ireland's Eye					250	200*	200	225	250	
Dublin Bay	84	124	358	116	190	52	263	196	358	Sep
Blackwater Estuary	175	465	182	118	195	261	77	167	261	Sep
Cork Harbour	17	349	149	116	128	246	170	162	246	Sep
Lough Swilly[1]	57	64	93	13	58	328	260	150	328	Nov
Dundalk Bay[1]	188	209	164	141	109	125	113	130	164	Sep
Ballycrenane/ Warren[1]						190	67	129	190	
Inner Galway Bay[1]	171	109	172	66	137	98	123	119	172	Nov
Courtmacsherry Bay, Broadstrand Bay & Dunworley[1]	136	181	85	110	208	102	78	117	208	Oct
Rockabill[1]					100			100	100	

[1]Site not of significant importance during the former period (2001/02 and 2008/09).

5 Pressures and threats facing wintering waterbirds

Waterbirds face significant challenges across their range throughout the year, with pressures on the breeding grounds, across their migratory route and on their wintering grounds; all potentially contributing to decreased productivity and increased mortality which ultimately leads to population declines. Here on the wintering grounds, waterbirds are sensitive to changes that may reduce the area of suitable habitat to feed or roost without disturbance, which may impact their ability to survive the winter or refuel in advance of their lengthy northward migration in the spring. Large-scale climatic changes are also causing shifts in distribution meaning birds from the north-east no longer need to travel as far as Ireland to find suitable wintering grounds. Discussed below are some of the most well understood and significant issues facing wintering waterbirds in Ireland. For the purpose of this discussion the term 'pressure' is used to describe issues negatively affecting waterbird populations currently and in the recent past, and the term 'threat' describes those issues likely to affect waterbirds populations negatively in the coming years. It is important to note that the current assessment relates to the time period as per reporting under Article 12 of the Birds Directive, in that pressures relate to the six-year period 2013-2018, while future threats relate to the future two reporting periods (i.e. within 12 years following the end of the current period). The pressures and threats are discussed in order of their significance (high, medium or low), although a wider and more general discussion is also provided under each heading. Pressures and threats are grouped as follows:

(1) Hunting and shooting; (2) Climate change; (3) Energy production and related infrastructure; (4) Recreational and other disturbance; (5) Fisheries and aquaculture; (6) Agriculture and forestry; (7) Urbanisation and development; (8) Water quality; (9) 'Others'. The final category 'others' is a discussion on other known potential pressures or threats facing waterbirds, but where the risks are either considered to be currently low, or where detailed information and data are lacking. Note, the list is not exhaustive, as there are likely many current and future threats which have not yet been identified.

The full list of high and medium pressures and threats identified for each species, including reference matierals, rationale and notes, is available in a supplementary file available at the following URL: www.npws.ie/publications/irish-wildlife-manuals. Only high and medium pressures and threats are included in this supplementary file, as per reporting requirements under Article 12 of the Birds Directive.

5.1 Hunting, shooting and incidental killing

5.1.1 Hunting and shooting

The E.U. Birds Directive recognises the legitimacy of hunting of wild birds as a form of sustainable use, providing social, cultural, economic and environmental benefits, and lists species on Annex II of the directive which may be hunted. The Wildlife (Wild Birds) (Open Seasons) Orders 1979 to 2012 specify the waterbird species which may be hunted in Ireland, when they may be legally hunted and, in some cases, exactly where hunting is permitted (https://www.npws.ie/legislation/irish-law/open-seasons-order / http://www.irishstatutebook.ie/eli/2012/si/402/made/en/print)

Two goose species (Canada and Greylag), ten ducks (Mallard, Teal, Gadwall, Wigeon, Pintail, Shoveler, Scaup, Tufted Duck, Pochard and Goldeneye) and four waders (Golden Plover, Snipe, Jack Snipe and Woodcock) may be legally hunted in the Republic of Ireland. The significance of hunting is considered to be a medium pressure/threat upon these species.

Most species with an open season may be taken throughout the state between 1st September and 31st January each winter, although there are greater restrictions around the hunting of Greylag and

Canada geese in Ireland, to ensure that birds from the resident feral/naturalised populations rather than the migratory populations are hunted.

In Iceland, an average of >40,000 Greylag geese were hunted each year from 2013 to 2016 (Environment and Food Agency of Iceland 2017), constituting a direct and high-level pressure and threat on the flyway population. This is therefore considered to be a high-level pressure/threat. Note that while Barnacle geese are hunted in both Greenland and Iceland, the numbers involved are low, so this is likely to only constitute a low-level pressure and threat.

In Ireland it is not mandatory to record and submit the number of birds harvested by an individual or group during the open season. It is therefore impossible to quantify the number of individuals of species listed on the Open Seasons Orders that are harvested each year. Such information would be beneficial to inform sustainable hunting practices. The medium threat categorisation above, should be considered as the best estimate.

The potential impacts of hunting are complex. For instance, hunting of certain wild bird species may be a source of compensatory mortality, reducing population density through harvesting which in turn benefits other individuals within the population. However, hunting may also be a source of additive mortality and have a direct negative impact on the numbers and conservation status of the target species, with the population unable to compensate for the removal of individuals through increased survival rates or higher reproductive output. In addition to the direct mortality of individuals, legal hunting is a source of unquantifiable disturbance which may have a negative impact on flocks and populations of quarry and non-quarry species through energy loss and an inability to meet nutritional needs. The potential for these indirect impacts underscores the importance of having a network of wildfowl sanctuaries where flocks that are flushed from one site can rest and feed at another site nearby without the risk of further shooting disturbance.

5.1.2 Illegal shooting and killing

An entirely separate issue to the above is the intentional illegal shooting and killing of species not on the quarry list, although this is impossible to quantify accurately. Hunting of Greenland White-fronted geese is illegal in Ireland, but a small number of poaching incidents have come to light in recent years, and many incidents are likely to go unnoticed and unreported. A similar ban is in place in Iceland but over 1,000 Greenland White-fronted geese are known to have been mistakenly shot during the previous reporting period (Stroud *et al*., 2012). Given the declines this species has undergone in Ireland in recent decades, additional mortality of birds constitutes a medium-level threat to their wintering numbers and range in Ireland.

Although shooting of Greenland White-fronts is generally the result of misidentification or poaching, illegal shooting in Ireland is often the result of conflict. Perceived conflicts between fishermen and Cormorants means this species is illegally persecuted in many parts of the country, despite evidence that their impact on salmonids is minimal (Tierney *et al*., 2011) and that their winter population trend in Ireland is negative in the short (-5%) and medium term (-28%). Any increase in the illegal killing of Cormorants could constitute a medium-level threat to the population in the coming years, with the potential for localised loss of the species at specific wetland sites. In some areas, birds are suspected to have been illegally killed due to conflicts such as agricultural impacts from geese (Brent, Barnacle, White-front, Pink-foot) and Whooper Swans. Such cases are likely to be limited in number and distribution, although cases are often difficult to substantiate or quantify.

Some-cases of illegal shooting of Grey Herons are known to have occurred in recent years (e.g. NPWS, 2013), the motivations behind which are not clear. Although cases of illegal shooting of waterbird species in Ireland are undoubtedly largely under-recorded, it is suggested that, at current levels of persecution they are unlikely to impact the conservation status of the respective species (i.e. low-level pressure). Any increase in the intensity or area of illegal shooting would be cause for significant concern, however.

5.1.3 Poisoning through lead gunshot and angling weights

In Europe, it is estimated that three million waterbirds suffer sub-lethal effects and a further one million die annually as a result of lead gunshot ingestion (Andreotti *et al.*, 2017). Studies in Europe have found high levels of lead toxicity and/or mortality when examining lead toxicity in swans (e.g. Newth *et al*., 2016), geese (e.g. Mudge, 1983) and both dabbling and diving ducks (e.g. Pain, 1990; Mateo *et al*., 1998), although levels can vary considerably between species within those groups and again depending on the site in question. Newth *et al*. (2013) found that lead poisoning continued to affect a wide range of British waterbirds long after legal restrictions were introduced, noting that lead may persist and accumulate in the environment for tens or hundreds of years and remain accessible to feeding waterbirds long after deposition (Rooney *et al*., 2007). Pain *et al.* (2015) estimated that in the UK 50,000 to 100,000 wildfowl (*c.* 1.5 to 3% of the wintering wildfowl population) die each winter as a direct result of lead poisoning. A recent report (Lead Ammunition Group, 2018), estimated that a further 150,000 to 300,000 wildfowl in the UK may suffer sub-lethal poisoning annually from lead shot ingestion.

In response to the risk of poisoning of waterbirds from the ingestion of lead gunshot and angling weights, a number of countries introduced legislation restricting or banning their use (Newth *et al.*, 2013). The UN Convention on Migratory species, to which Ireland is party, also adopted a resolution calling for all Parties to phase out lead ammunition across all habitats by November 2017. In Ireland, there are currently no restrictions on lead ammunition use, however, and there has been little study on the threat of lead poisoning to date. O'Halloran *et al*. (1991) investigated lead toxicity levels in Irish Mute Swans and found that almost 70% of dead birds examined died directly from lead poisoning, and others are likely to have died due to sub-lethal effects resulting in collisions. At some sites, spent gunshot was the source of lead poisoning, but at others it was discarded anglers' weights. Three Whooper Swans were also found to have died from lead poisoning as part of the study (O'Halloran *et al*., 1991). While O'Connell *et al.* (2009) reported a marked decrease in Mute Swan blood lead levels in Co. Cork from 1983 to 2006, they also determined that a small percentage of the study population still had significantly elevated lead levels, likely resulting in sublethal effects.

The extent of lead pollution and risk to waterbirds is likely to be site-specific, dependent upon both the level of hunting and fishing and the number of waterbirds aggregated at the site. This risk may be lower in Ireland compared to elsewhere Europe given the lower densities of anglers and shooters in Ireland (e.g., see www.face.eu/members/). Thus, given the limited available information, the current pressure and predicted threat of lead poisoning from gunshot and angling weights to wildfowl in Ireland was identified as of low impact. However, further investigation is required in Ireland to assess the likely true impact and risk.

5.1.4 Bycatch

The incidental killing of seabirds in gillnets, trammel nets and other fishing gear has long been known as a problem across much of the world. There are no data as to the extent that this issue is likely to be affecting Irish birds. In Irish waters, the highest densities of static nets that may be cause for concern for birds are off the south-coast (Gerritsen & Lordan, 2014). Zydelis *et al*. (2013) reviewed the feeding ecology of seabird species to determine their susceptibility to bycatch in gillnets. Based on their review, the species frequently recorded during I-WeBS counts that are likely to dominate bycatch composition are sea ducks including Common Scoter, Velvet Scoter, Long-tailed Duck and Eider. Diver and Grebe species in coastal and offshore waters are also considered susceptible to bycatch (Zydelis *et al*., 2013). Gulls are also occasionally netted as bycatch.

5.2 Climate change

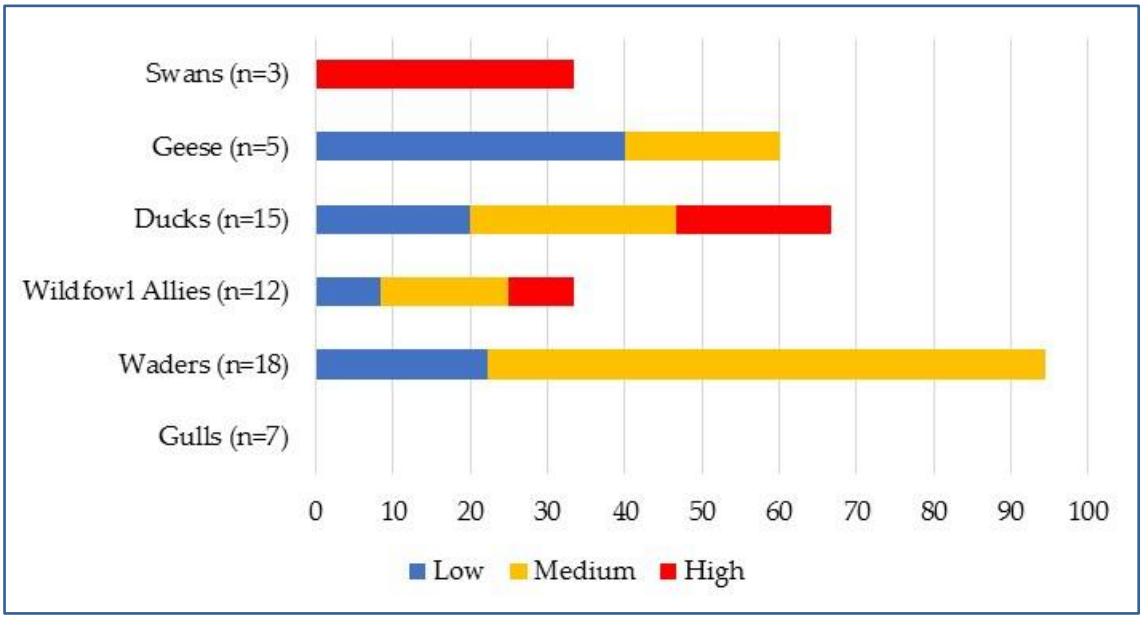


Figure 76 The proportion of each species grouping affected by climate change (i.e. temperature rise or sea level rise combined) with the pressure/threat ranked as high, medium or low.

5.2.1 Temperature rise

Climate change is arguably the most significant threat facing wild bird populations, particularly those that migrate long distances (Robinson *et al*., 2009). Migratory waterbirds are dependent upon the right habitat being available in the right place at the right time. Changes in temperature, precipitation levels and sea level all greatly increase the risk of a temporal or spatial ecological mismatch occurring, which may have deleterious effects on bird populations (Robinson *et al*., 2009; Reneerkens *et al*., 2016) as well as affecting the range and distributions of species.

Given that Ireland is at the western edge of the wintering range for many waterbird species that breed in Scandinavia, Northern Europe and Arctic Russia, it is likely that the effects of climate change and increasing winter temperatures are making it increasingly disadvantageous for many species to migrate as far as Ireland for the winter. The most notable example of this is the Bewick's Swan, whose numbers have been declining here since at least the 1980s despite flyway population increases until the early 2000s. There are only *c*. 20 Bewick's Swans remaining in Ireland (Crowe *et al*., 2015; Burke *et al*., 2018b), wintering in the south-east in county Wexford, and it is likely that this species will cease to winter here in the coming years. Rising temperature is therefore both a high-level pressure and threat for Ireland's Bewick's Swan population.

Based on research by Gillings *et al*. (2006), Lehikoinen *et al*. (2013) and Pavón-Jordan *et al*. (2018), in combination with recent observed population trends for the respective species in Ireland (Burke *et al*., 2018b), climate change-related temperature changes have been ranked as a pressure and a threat for 14 waterbird species as follows:

High-level: Goldeneye, Great Crested Grebe, Pochard, Tufted Duck.

Medium-level: Coot, Cormorant, Golden Plover, Lapwing, Pintail, Shelduck, Shoveler, Wigeon.

Gillings *et al*. (2006) found that the winter distribution of Golden Plover and Lapwing in Britain has shifted east since the mid-1980s, which correlated with increased mean winter temperatures and a reduction in the frequency of cold spells which would allow waders to winter closer to their breeding

grounds. Lehikoinen *et al*. (2013), using data from I-WeBS and WeBS amongst other datasets from the International Waterbird Census (IWC), demonstrated strong north-eastwards shifts in the centres of gravity of the wintering range of three diving duck populations along the North-West European flyway in response to changes in temperature since 1980. Numbers of Tufted Duck, Goldeneye and Goosander increased by over 140,000 in the north-east part of their wintering range (Finland, Sweden), as rising temperatures have provided more ice-free habitat closer to their breeding grounds. Over the same period, countries such as Ireland, France, the Netherlands and Switzerland in the south-west of the flyway have lost in the region of 128,000 individuals (Lehikoinen *et al*., 2013). More recently, Pavón-Jordan *et al*. (2018), also using I-WeBS data as well as other datasets from the IWC, identified changes in wintering waterbird distributions at large geographical scales in response to short- and long-term changes in weather conditions. Again, the pattern was for a shift to the north-east as conditions in northern Europe became more favourable (i.e. more mild and wet). The study shows a long-term north-east shift of populations of species preferring deep waters. Shallow-water species also showed a north-east shift during the 1990s and early 2000s but shifted to the south-west again after the mid 2000s in response to several consecutive harsh winters. Although they did not exhibit a similar shift south-westward again in response to the harsh winters in the mid 2000s, the rapid north-east increases in abundance of deep-water species ceased at this time. Many climate change scenarios predict a continued increase in winter mildness (IPCC, 2012), which suggests that continued north-east shifts of the ranges of many of Ireland's wintering waterbirds are likely (Pavón-Jordan *et al*., 2018). The results of this study also illustrate the different reactions of waterbird species to changes in weather and climate, with individual ecology and habitat requirements being important factors.

The effects of temperature changes on waterbird populations are not just felt on the wintering grounds. Arctic-breeding wading birds are becoming increasingly negatively affected by changes in temperatures on their breeding grounds. For example, researchers reported in 2018 that summer temperatures in Zackenburg (north-east Greenland) have increased steadily over the last few decades which has led to an ecological mismatch between the timing of insects and the timing of shorebird chicks (Team Piersma, 2018). Furthermore, climatic models have shown that the amount of snow is a key driver of this mismatch, and while snow melts quicker with higher summer temperatures, climate models also predict that the amount of winter precipitation (and snow) will increase. During 2018 the amount of snow was so excessive that shorebirds such as Sanderling flocked together in snow-free areas and failed to breed, while many also perished. Despite the Sanderling breeding range extending beyond north-east Greenland, such failures on the breeding grounds may well result in changes to overall population size in the future, especially if such patterns are repeated with more regularity.

It has been reported that levels of nest predation on wader breeding grounds in northern-temperate and Arctic zones, where almost all of our wintering waterbirds breed, have increased twofold and threefold, respectively, compared with historic values and in line with increased ambient temperature and temperature variability (Kubelka *et al*., 2018). However, these results have been disputed (Bulla *et al*., 2019). Increased nest predation, as a result of climate change, may therefore be an important factor in the recent noted declines in global wader populations.

Other issues facing these birds on the breeding grounds as a result of climate change include suitable habitat shifting, contracting and declining (Wauchope *et al*., 2016) and timing mismatches between chick hatching and peak food abundance (e.g. McKinnon *et al*., 2012; Reneerkens *et al*., 2016). Along the migration route there is a risk that climate change will reduce the availability of suitable habitat at stopover sites and a bird's ability to build up adequate nutrients and fat stores, thus reducing survival (Studds *et al*., 2017) or impacting an adult's ability to reproduce successfully following spring migration (Drent *et al*., 2007). In addition to the immediate and short-term impacts of climate change at specific life history stages or locations along the migratory flyway, there are also cumulative effects to consider as well as the likelihood of negative carryover effects manifesting later in the year, or in subsequent years (O'Connor & Cooke, 2015). Johnson *et al*. (2013) projected future abundance of

wintering waterbirds in north-west Europe under a scenario of increased global mean temperature of 2.8°C by 2050 and 4.4°C by 2080. They found that climate change has already been a significant driver of large-scale population trends and that most species are likely to undergo large population declines under the projected scenarios, with a mean population trends of -33% to 2080 across 45 species. Interestingly, there were projected to be 58% more birds in the entire wintering waterbird assemblage in 2080, with a small number of species benefitting significantly from the changes. Based on the UK SPA network, they predicted that the existing network of protected sites is likely to support significant populations of wintering waterbirds in the future, although that is not to say that the network will protect each species from climate change impacts (Johnson *et al*., 2013).

5.2.2 Sea level rise and wave exposure changes

Sea level rise and wave exposure changes due to climate change have been categorised as a medium-level threat to 11 wader and two wildfowl species, and as a low-level threat (at present) to eight wildfowl and ally species and a further six waders wintering in Ireland.

At coastal sites, storm surges and flooding events can temporarily result in intertidal areas being unavailable for foraging waterbirds, while over time these events can affect the shape of estuaries and the nature and distribution of sediments (e.g. Stevens, 2010; Jang *et al*., 2013) with knock-on effects on the distribution and abundance of invertebrates, thus potentially affecting the numbers and composition of waterbirds supported by an estuary. Global mean sea level has risen by 0.19 m over the period 1901–2010 (IPCC, 2013). Predicted changes to the Irish coastline are expected to result from a combination of sea level rise, increasing frequency of storm surge events and from coastal erosion. Flooding at coastal locations is likely to be exacerbated by predicted increases in rainfall and consequent enhanced river flow (Crowe *et al*., 2013). An average sea level rise of 0.5 to 1 m by the end of the century, in combination with storm surge events, could result in approximately 300 to over 1,000 km^2 of coastal lands around Ireland being inundated by the sea (DeVoy, 2008). A rise of 1 m in sea level would see 30% of existing wetlands disappearing (DeVoy, 2008). The habitats most at risk include low-lying coastal lagoons, saltmarsh and estuaries, and of particular vulnerability are those that are prevented from extending landward because of the presence of some fixed or artificial boundary (Wall *et al*., 2016). Crowe *et al*. (2013) identified a total of 71 sites that regularly support significant concentrations of waterbirds and that are low-lying and vulnerable to increasing sea levels. Given the increased prevalence of flooding, as well as the predictions for future sea level rise, there has been a greatly increased focus on flood defence and relief schemes around the country, with some coastal works under construction, others at planning stage, as well as plans to modify rivers, lakes and turloughs in the midlands and west. In many cases this involves dredging to deepen the river channel, removal of trees, building concrete walls, constructing earth embankments and pumping stations and other similar solutions. These hard engineering responses to flooding have the potential to significantly impact waterbirds at previously suitable sites as these man-made structures prevent natural coastal habitats (e.g. saltmarsh, intertidal habitat) from moving landward as sea level rises, squeezing them up against the hard defences. This is known as 'coastal squeeze' and means the extent and functioning of the coastal habitats reduce over time, along with the habitats and species that they support; effectively a form of habitat loss (Pontee, 2013). Impacts from hard flood defences are not unique to the coast however; for example, works to relieve or prevent flooding in the midlands on the River Shannon, its tributaries and nearby lakes and turloughs could significantly reduce the suitable available habitat for dabbling duck species in the region. Finally, outside the wintering season in Ireland, prolonged drought conditions may impact the amount of suitable foraging habitat available for species such as Barnacle geese on their return here in the autumn, though this currently considered a low-level threat.

5.3 Energy production and related infrastructure

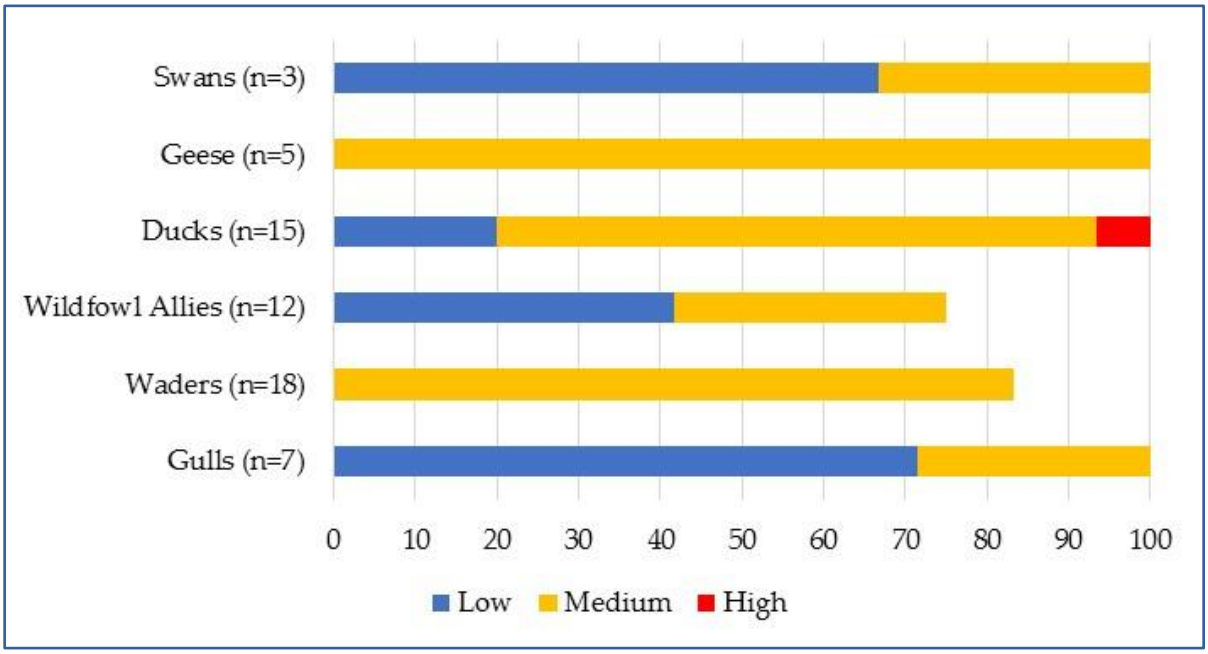


Figure 77 The proportion of each species grouping affected by energy production (i.e. wind-wave-tidal devices & electricity/communications infrastructure combined) with the pressure/threat ranked as high, medium or low.

5.3.1 Onshore wind energy

As the environmental and economic threats of climate change loom, governments across much of the world have set ambitious targets to decarbonise their economies. Many have also recognised the potential economic opportunities that come with rapidly developing sectors such as the renewable energy industry. Wind energy from onshore windfarms is currently the largest contributing source of renewable energy in Ireland – providing 85% of Ireland's renewable energy in 2016, and 20.9% of our total electricity demand (SEAI, 2017). The first commercial windfarm in Ireland was established in 1992 and by the end of 2017 Ireland had 3,127MW of installed wind power capacity, almost all of which was onshore (WindEurope, 2018). The bulk of Irish wind energy projects are in upland and coastal areas, although developments in other areas are becoming increasingly technologically and economically feasible. Onshore windfarm capacity in Ireland grew by 426MW in 2017, breaking previous records and ensuring Ireland had the highest level of newly installed wind capacity relative to its total power consumption in Europe in 2017 (WindEurope, 2018). Increased production of renewable energy will be vital in reducing greenhouse gas emissions and reducing our climate impact, but it is important that renewable energy developments are located sensitively so as to avoid deleterious ecological impacts.

Existing onshore windfarms have been considered a low-level pressure to Irish waterbirds to date, though there is no formal compilation of pre-, during- or post-construction windfarm survey datasets at a national level on which any analysis can be carried out.

The EU Renewable Energy Directive (2009/28/EC) requires the EU to meet at least 20% of its energy needs with renewables by 2020 and 32% by 2030. Each country was set individual targets based on their existing and potential renewable energy resources and Ireland was set the target of producing 16% of its energy needs from renewable sources by 2020. In the Government Strategy for Renewable Energy: 2012-2020 (2012) five strategic goals were outlined, the first of which was to develop more renewable energy from onshore and offshore wind power for both the domestic and export markets.

Continued future expansion of onshore windfarms is considered to pose a medium-level threat to Whooper Swan, Greenland White-fronted Goose, as well as 11 duck species and 15 waders, and a low-level threat to other goose and swan species, as well as Coot.

The main potential hazards to birds from windfarms are collision mortality, disturbance (displacement, exclusion, barriers to movement) and loss of habitat (Langston & Pullan, 2003). It should be noted that the relationship between windfarms and birds is complex and the potential for impacts is dependent on a number of factors including the extent, type and timing of the development, local topography, habitats at the site and in the vicinity, numbers and species of birds present, and their distribution in the local area (Drewitt & Langston, 2006; McGuinness *et al*., 2015). The processes for acquiring planning permissions in Ireland for such developments should protect designated SPA sites and their listed waterbirds from the impacts of windfarm developments. However, there are potential risks from windfarms situated away from designated wetlands but adjacent to grassland feeding sites for geese (especially Greenland White-fronted Goose), Whooper Swans and some wading birds (mostly Curlew, Lapwing, Golden Plover), as well as the possibility of windfarms being placed between important wetland sites resulting in waterbirds coming into contact with windfarms as they move between different wetlands, or that their movement is impeded.

5.3.2 Offshore wind energy

While Ireland's renewable energy supply largely comes from onshore windfarms at present, there is expected to be significant and rapid growth in offshore windfarms in the short-term, with other offshore sources such as wave energy, and to a lesser extent tidal turbines, being developed in the medium-to-long term. Ireland's only offshore windfarm to date was deployed as a demonstrator project in 2004 at the Arklow Bank on the east coast. Licenses have been granted for a number of larger developments in the Irish Sea which have yet to be built, and a number of other projects are in the early planning and consenting stages (Burke, 2018). In the short-term, offshore wind energy developments in Ireland are likely to be concentrated in the Irish Sea as the east coast offers more accessible sites of depths under 50m.

Much of the concern surrounding the ecological impacts of offshore renewable devices is centred around seabirds, including seaducks, divers, grebes, cormorants, gulls and terns, which are all recorded during I-WeBS. Ramiro & Cummins (2016) determined scores for Irish seabird species based on their relative sensitivities to collision with offshore windfarms, displacement by offshore windfarms, and impacts from wave and tidal devices. Based on their results, in combination with I-WeBS data on population sizes and distribution and the projected developments in the coming years, offshore renewable energy devices are thought to pose a high-level threat to Common Scoter, and a medium-level threat to Herring Gull and Lesser Black-backed Gull, as well as to Cormorant, Red-breasted Merganser, and both Great Northern Diver and Red-throated Diver. Other diver, grebe, sea duck and gull species in Irish waters are likely to be at low threat level from these developments in the near future.

5.3.3 Collision risk

As the number and footprint of renewable energy developments increases in Ireland, so too does the potential for cumulative impacts that may negatively affect local waterbird populations. The development of associated grid infrastructure should be given due consideration in combination with proposed renewable energy developments. For example, the development of the above-ground cable network to transmit electricity may increase the risk of collision mortalities in some areas. With this in mind, the expansion of electricity and communication cable network is considered to pose a medium-level threat to Whooper Swan, Greenland White-fronted Goose, Greylag Goose, Pink-footed Goose, Light-bellied Brent Goose and Barnacle Goose. Given their restricted range, collision with cables only represents a low-level threat to the remaining Bewick's Swans in Ireland, and conversely their widespread distribution means the Irish Mute Swan population is similarly at low risk. Although

occasional incidents are known, collision mortality from overhead cables has represented only a low-level pressure to these species in recent years.

5.4 Recreational and other disturbance

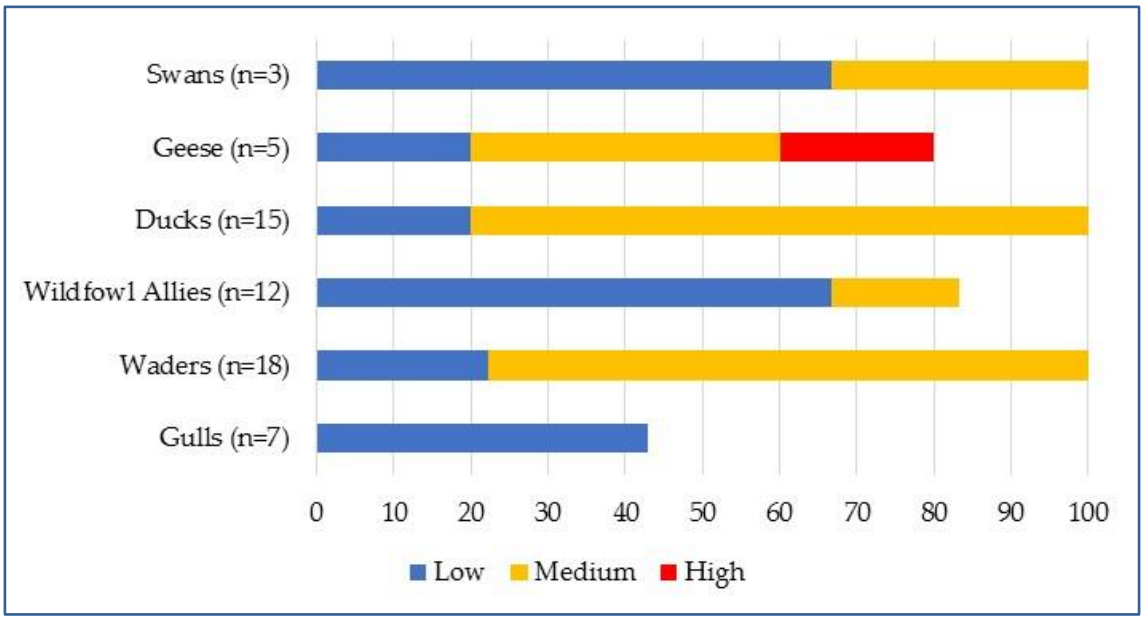


Figure 78 The proportion of each species grouping affected by recreational and other disturbance. The pressure/threat is ranked as high, medium or low.

5.4.1 Land-based recreational disturbance

Disturbance relates to any activity that results in a waterbird being displaced from an area. Moving in response to disturbance, especially if frequent, can exert pressures upon a waterbird's foraging success as well as exerting an energetic cost due to flying to an alternative foraging area. Disturbance can also act upon roosting habitat thereby increasing a bird's energy expenditure in the same way. While many of the aforementioned pressures and threats exert effects via disturbance, recreational use of coastal and inland wetlands provides perhaps the most visually obvious form of disturbance to waterbirds, as birds generally move, often taking flight, in response.

Following review, continued or increased disturbance is considered to pose a medium-level pressure and a high-level threat to Greenland White-fronted Goose, and a medium-level threat to Whooper Swan.

Continued or increased disturbance poses a medium-level pressure and threat to:

- Greylag Goose and Light-bellied Brent Goose;
- 11 species (73%) of ducks and 12 species (67%) of wader.

In Dublin, there have been some conflicts between Light-bellied Brent geese and urban residents who are unhappy with the geese fouling sports pitches although this is currently considered to be a low-level pressure and threat.

The effects of disturbance upon waterbirds have been a topic of interest, research and concern to ecologists, wildlife managers and wildlife surveyors for many years. Waterbird behavioural responses to disturbance can vary from subtle declines in intake rates to more serious changes such as avoidance of entire areas or sites (Mitchell *et al.*, 1989). Waterbirds have been found to exhibit different behavioural responses to various disturbance types (Lafferty, 2001; Kirby *et al.*, 1993). However,

repeatedly across studies (e.g. Phalan & Nairn, 2007; Adcock *et al*., 2018), dogs on and off lead, and people walking (especially within intertidal areas) are found to elicit the highest levels of response behaviour from waterbirds. Indeed, a recent study found that consistent recreational use of shorelines particularly by dogs, has a negative impact on waterbird numbers (Stigner *et al*., 2016). This is perhaps because while some waterbird species in areas with levels of recreational activity have been found to habituate to some activity types (Nairn, 2005), birds typically do not habituate to dogs running off lead because canids represent a seemingly genuine predator threat (Lafferty, 2001; Sastre *et al*., 2009).

The true significance of any disturbance impact is hard to predict. For example, the fact that a bird flies away from a disturbance does not automatically imply a serious negative effect if the bird has alternative habitat to go to, of similar quality and/or if birds return to the former area once the disturbance event has finished. In this context, it becomes impossible to distinguish between animals that do not respond to disturbance because they are unaffected by it and those that are constrained to stay in the area but may suffer severe costs (e.g. reduced foraging time or nest defence) as a result (Gill, 2007). However, it is important to note that even a short-term displacement can be of significance, if the birds have no similar quality habitat to move to, or if displacement leads to knock-on ecological effects such as increased competition within and/or between different species for a common food source. Birds will also suffer more of an impact when already under pressure for example, in cold weather events when struggling to feed enough to survive. Ultimately, if the effects of disturbance reduce species fitness[1] (i.e. reduce survival or reproductive success) then consequences at population level may result, and numbers of birds may decline, at site-level and beyond. Providing recreational spaces while simultaneously protecting the sensitive ecology of a site will continue to be a challenge for conservation managers (Batey, 2013) and ultimately acceptable levels of human disturbance may need to be determined and then managed (e.g. Beale, 2007; Gill, 2007). For example, a recent study has suggested that by restricting dogs in areas in use for recreation, waterbird numbers can be significantly increased overall (Stigner *et al*., 2016).

5.4.2 Water-based disturbance

Waterbird species that occur on the water are also subject to disturbance events from a variety of sources. Many coastal and inland wetlands play host to a wide variety of recreational activities including boat trips, kayaking, windsurfing and paddle boarding, although many of these activities are more prevalent during summer months and outside of the wintering waterbird period. That said, a study of the effects of kite-surfing on waterbirds outside of the winter months indicated that kitesurfing does affect the behaviour of waterbirds but to a lower extent than some other activities (Adcock *et al*., 2018), and that cumulative levels of disturbance at some sites may already be at a serious level. Given the increase in outdoor recreational activities and the increasing number of proposals for coastal walkways, greenways and blueways, recreational activities around coastal and inland wetlands is set to increase. As ever, the potential for cumulative impacts will need to be addressed adequately. Greenland White-fronted Goose has been identified as an Irish species at high risk from disturbance from sports, tourism and leisure activities in the coming years. Certainly, any increase in activity at their main sites in Wexford has the potential to impact a large proportion of the Irish and flyway populations.

Disturbance from boat traffic (shipping lanes, ferry operations etc.) also presents a problem for marine species. A recent Irish study found that Red-breasted Mergansers have a high degree of behavioural sensitivity to disturbance from marine traffic, while similar studies featuring Great Northern Diver suggested that this species is less sensitive (Gittings *et al*., 2015, 2016b). Red-breasted Merganser and Great Crested Grebe have been identified as species for which disturbance from boat traffic constitutes a medium-level pressure and threat, while for Common Scoter this is deemed to be a low-level pressure in recent years but potentially a medium-level threat for the future. Species such as Cormorant, Great Northern Diver and Red-throated Diver are highly mobile in response to food

[1] Defined as a measure of the relative contribution of an individual to the gene pool of the next generation.

availability and widely dispersed, so are unlikely to be under the same level of pressure or threat from boat traffic disturbance. Other marine species including Slavonian Grebe, Eider, Long-tailed Duck and Velvet Scoter are present in Ireland in small numbers and with a somewhat scattered distribution, again meaning that boat traffic disturbance is unlikely to represent anything more than a low-level pressure or threat.

5.5 Fisheries and aquaculture

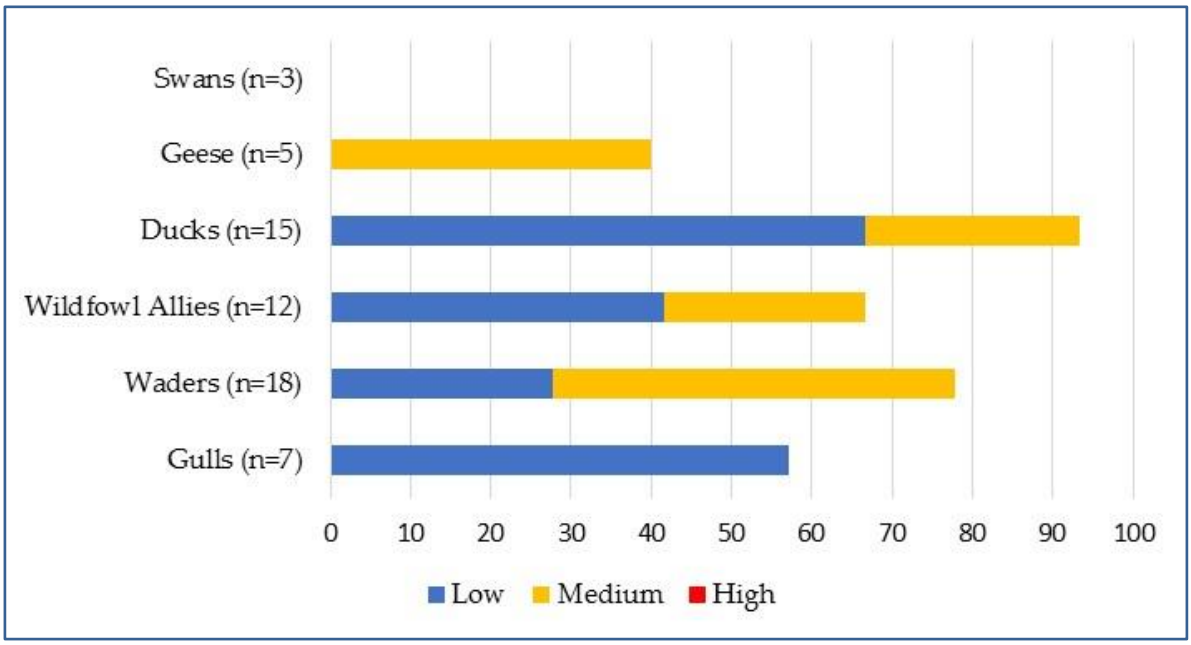


Figure 79 The proportion of each species grouping affected by shellfish harvesting and aquaculture. The pressure/threat is ranked as high, medium or low.

5.5.1 Shellfish harvesting and dredging

This category includes the dredging of shellfish as the final product (e.g. Cockle *Cerastoderma edule*), or the dredging and subsequent relaying of seed (e.g. Mussel *Mytilus edulis*) for on-growing and later harvesting by dredging.

These activities are thought to comprise a medium-level pressure and threat to 15 waterbird species, namely:

- Ducks and sea ducks – Common Scoter, Eider, Scaup and Shelduck;
- Divers and grebes – Great Northern Diver, Red-breasted Merganser and Red-throated Diver;
- Waders – Bar-tailed Godwit, Curlew, Dunlin, Grey Plover, Knot, Oystercatcher, Ringed Plover and Sanderling.

In addition, harvesting of bottom-grown mussels at Wexford Harbour poses a medium-level threat to Greenland White-fronted Goose. Currently diurnal harvesting is undertaken, in an area where roughly 70% of the Irish population of this species roost at night. If harvesting was to continue after dark in the future, then this has the potential to significantly impact on a large proportion of the population.

Impacts upon waterbirds include competition for a common resource (i.e. the shellfish is also a waterbird prey item), damage to benthic sediments and impacts upon non-target benthic species, and the associated disturbance that occurs in association with the activities.

The harvesting of Cockles is confined largely to Dundalk Bay. As with aquaculture in Special Protection Areas (see below), there is a requirement that this activity operates in compliance with the requirements of the Habitats and Birds Directives. The European Union (Birds and Natural Habitats) (Sea-Fisheries) Regulations 2013 (SI 290 of 2013) also provide for the submission of a draft *Fisheries Natura Plan* and *Appropriate Assessment* of the plan to identify where a fishery may be allowed to proceed while also addressing risks to protected species and habitats (e.g. Fisheries Natura Plan for Cockle in Dundalk Bay, 2016-2020 (Department of Agriculture, Food and the Marine). On-going monitoring of waterbird populations is essential in these sites in order to identify any impacts at the earliest possible point in time.

5.5.2 Aquaculture

Aquaculture of both shellfish and finfish is a growing sector in Ireland. BIM (2018) reported that aquaculture output in 2017 increased to 47,147 tonnes of farm-gate produce, worth €208.4 million. Intertidal and shallow subtidal habitats of coastal bays and estuaries are widely used for various types of aquaculture, including seed mussel nurseries/intertidal on-growing (bottom culture) (e.g. Castlemaine Harbour, Carlingford Lough), and the cultivation of the Pacific Oyster *Crassostrea gigas* (e.g. Dungarvan Harbour, Ballymacoda Bay, Bannow Bay, Galway Bay). The growing of Pacific Oysters using the bag and trestle system is the most widespread activity within Special Protection Areas and occurred in 16 SPAs in 2012, occupying a total area of 2,262 ha (Gittings & O'Donoghue, 2012). These figures may well have now increased.

Intertidal trestles can cover extensive areas of intertidal and shallow subtidal habitat. For waterbirds, the presence of trestles can therefore be equivalent to habitat loss as the habitat becomes unsuitable due to the cover itself, and the deleterious effects on the benthic prey due to the smothering of the habitats with faecal and pseudofaecal material, as well as other detritus generated by the culture process.

Extensive research on the potential impacts of this activity upon waterbirds has been undertaken within Ireland. Gittings & O'Donoghue (2012) categorised species responses to these activities and reported considerable variation: Oystercatcher, Curlew, Redshank, Greenshank and Turnstone exhibited a neutral/positive response; Light-bellied Brent Goose, Black-headed Gull, Common Gull and Herring Gull exhibited a variable response (i.e. response varied between sites); Shelduck, Ringed Plover, Lapwing, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Great Black-backed Gull exhibited negative responses; while Grey Plover and Knot exhibited an exclusion response (i.e. they were completely excluded from oyster trestle blocks.

In light of the above research, aquaculture is considered to pose a medoim level pressure and threat to eight wader species as follows: Bar-tailed Godwit, Black-tailed Godwit, Curlew, Dunlin, Grey Plover, Knot, Oystercatcher and Sanderling. In addition, there is a medium-level threat to Light-bellied Brent Goose due to the potential for impacts upon intertidal seagrass beds as well as from disturbance caused from the activities.

The species that show the strongest negative patterns of association with trestles appear to be those that tend to feed in large flocks of tightly-packed individuals (e.g. Knot, Sanderling, Dunlin). Gittings & O'Donoghue (2016a) suggest that the negative behavioural response may be due to the oyster trestles interfering with the flocking behaviour by making it difficult for individuals in large flocks to remain in contact as they become dispersed across several lines of trestles. Another possible reason for waterbirds to avoid trestles is that the perceived predation risk may be higher within the trestle blocks due to the trestles interfering with sightlines. In contrast, the Grey Plover showed a strongly negative pattern of association with trestles, but is a species that tends to feed as widely dispersed individuals rather than flocks. Individual birds require open areas to detect prey at the surface over a wide area, and then make short runs to catch the prey and it was suggested that the presence of oyster trestles may interfere with this behaviour (Gittings & O'Donoghue, 2016a). As with cockle harvesting (dredging) above, there is a requirement that aquaculture activities operate in compliance with the

requirements of the Habitats and Birds Directives. To this end, several Appropriate Assessments have been undertaken in recent years with varying conclusions. On-going monitoring is being carried out at several sites (for more information refer to: http://www.fishingnet.ie/sea-fisheriesinnaturaareas/).

5.5.3 Marine fisheries

Commercial fisheries in Irish waters are diverse, with many different techniques employed: eight main groups which include demersal otter trawls, beam trawls, demersal seines, gill and trammel nets, longlines, dredges, pots and pelagic trawls (Cummins *et al*., 2016). Pressures on the environment from fishing arise from the over-harvesting of target species and the unintentional catching of non-target fish species and other species such as cetaceans, seals, seabirds and benthic organisms (see 'bycatch' below). Fishing activities such as trawling and dredging can injure or kill benthic organisms and can result in the damage or destruction of habitats (Wall *et al*., 2016). Over-fishing is the biggest problem. Ireland currently has the third highest rate of overfishing in Europe with quotas coming in at more than 20 per cent above targets (TAC, total allowable catch) (Carpenter & Heisse, 2019). Larger, longer-lived species (e.g., tuna, cod) have been significantly depleted leading to fishing fleets increasingly concentrating on catching smaller, shorter-lived, plankton-eating species such as mackerel, sardine and sandeel, mostly known as 'forage fish,' as well as invertebrates such as mussels, prawn and shrimp, which are nearer the bottom of the food chain. This has major implications for marine food webs and ultimately marine food webs risk collapse if over-fishing is not addressed (Pauly *et al*., 1998). Recent concerns have arisen over the practice of pair trawling in sheltered inshore bays and estuaries such as Cork Harbour. This is a practice whereby two boats drag a single large net between each other. Pair trawling, which is banned in the UK, targets sprat which is processed into fish meal. Sprat is a small shoaling fish and is a keystone of the marine ecosystem being prey for larger fish such as cod, as well as sea birds and piscivorous waterbirds. Not only does the activity appear unsustainable, but there is also a risk of by-catch and disturbance to seabirds.

5.6 Agriculture and forestry

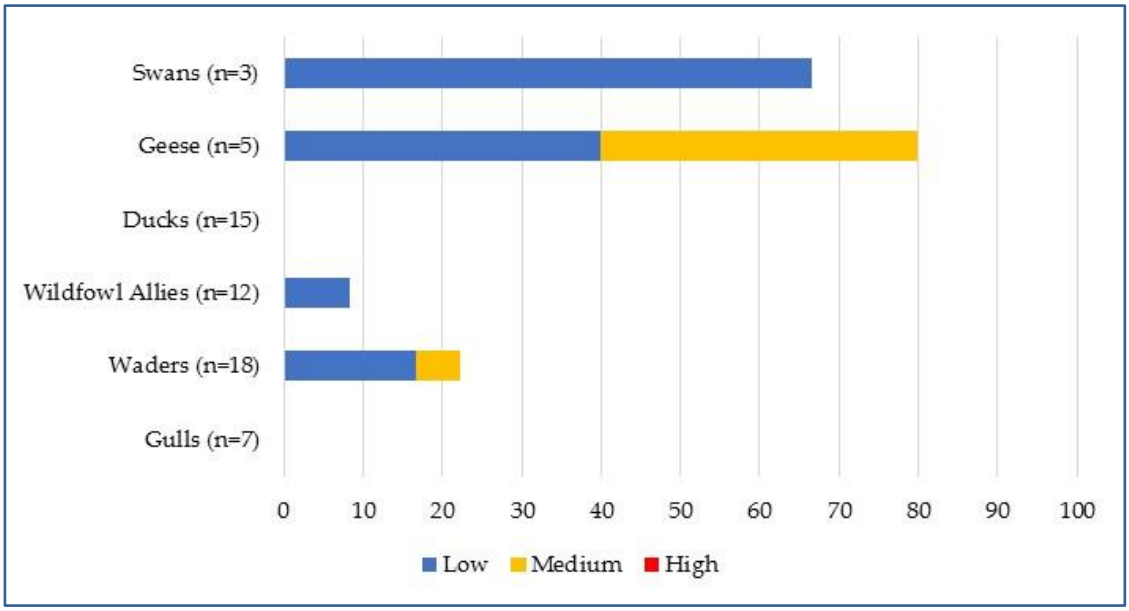


Figure 80 The proportion of each species grouping affected by issues surrounding agriculture and forestry (all factors combined). The pressure/threat is ranked as high, medium or low.

Almost 70% of Ireland's land area is under agricultural use (EPA, 2015) and farmland borders most inland wetlands that are relied upon by migratory waterbirds during the winter. Our migratory swan

and goose species feed directly on agricultural grasslands, stubble fields and winter cereals, often returning to nearby waterbodies to roost at night. Waders such as Lapwing, Golden Plover and Curlew are also heavily reliant on agricultural lands away from wetlands where they can feed on the invertebrates in the soil. These species are therefore particularly vulnerable to changes in agricultural land use and management.

For most swans and geese in Ireland the main threat is likely to be conversion of improved pasture and semi-improved wet grassland to other crop types or to forestry. In the past, conversion of grasslands to biomass crops around Lough Foyle made previously popular feeding areas unsuitable for swans and geese, although many of these areas have since reverted to grass. A shift towards increased biofuel production is likely to occur within Irish agriculture in the coming years (SEAI, 2016) which could potentially displace geese from currently relied-upon feeding areas. Over-wintering geese are highly site faithful (Wilson *et al*., 1991), so changes to habitats at a few key sites could have a significant negative impact on local flocks and regional species distribution as a result. Conversion of one agricultural land use to another is therefore considered a medium-level threat for both Greylag Goose (Icelandic) and Greenland White-fronted Goose. In recent years it is thought to have acted as a low-level pressure for both species, as well as for Light-bellied Brent geese, Whooper and Bewick's Swans and grassland-feeding waders (Lapwing, Golden Plover) and likely constitutes a continued low-level threat for the coming years. For Barnacle geese, the threat that their preferred coastal and offshore island grassland sites might be converted to different crop types appears to be low at present.

Ireland is projected to increase forest cover by 15,000ha annually to reach targets of 18% forest cover by 2046 (DAFM, 2014). Many of the sites favoured by Greenland White-fronted Goose in the north-west and midlands are on marginal agricultural land of modest grazing value, which are typical of sites that have been afforested in recent years. Although the SPA network should prevent significant habitat change at protected wetland sites, grassland feeding sites away from those wetlands have no statutory protection. This has been flagged as a significant threat for flocks in Connemara, Mayo, the River Suck and the Midland Lakes, amongst others, as well as having reduced suitable habitat on the South Slob in Wexford in the past. There is also the threat that afforestation will take place on lands neighbouring those areas used by Greenland White-fronted geese, which may deter them from feeding even if suitable foraging habitat remains in the area. Smaller scale modifications to agricultural habitats including division of fields by fencing, or tree planting on field boundaries, which may also deter geese and swans from feeding on previously preferred sites. Given that the majority of the Irish population of Greenland White-fronted Goose now resides on sites in Wexford that are unlikely to be further impacted by forestry in the near future, forestry is currently considered here to represent a medium-level threat to this species. There are some species that we know little about in an Irish context, such as Snipe and Jack Snipe that may also be impacted to a similar extent (i.e. medium-level threat) by the establishment of forestry on previously wet and rushy grassland sites. Shallow, nutrient-rich waterbodies with plenty of submerged vegetation, preferred by species such as Coot (Lewis *et al*., 2018), could be seriously impacted by increased forestry cover in the surrounding areas, although water protection measures (setback, buffer zones, silt traps etc.) should prevent significant impacts on the habitat and ensure any threat to the waterbirds therein is minimal.

Changes to grassland management can also significantly reduce the suitability of important sites for grassland-feeding waterbirds. Greenland White-fronted geese prefer longer grass heights than other goose species, whereas Barnacle geese show preference for swards of <10cm in height, and Light-bellied Brent geese prefer even shorter swards (<5cm for Dark-bellied Brent, likely similar for Light-bellied Brent) (Vickery & Gill, 1999). Given that Greenland White-fronted geese in most of the 'down-country' flocks (i.e. outside Wexford) feed on marginal land that is already grazed at low intensity, there is a threat of agricultural abandonment in many areas which would quickly lead to a tall sward height that would exclude the geese from feeding. This represents a low-level threat that may impact White-fronts at specific feeding sites in their range outside Wexford and may also be problematic for grassland-feeding waders such as Curlew, in the same areas. For Barnacle geese, agricultural abandonment also poses a threat, particularly on offshore islands where maintaining grazing is

logistically difficult (e.g., has occurred in Scotland (McKenzie, 2014)), though any immediate risk is thought to be low. Lapwing and Golden Plover may be similarly impacted, although given their widespread distribution, the threat to the Irish populations of these species remains low overall. Conversely, overgrazing by sheep, particularly in years of poor grass growth or when sheep continue to graze fields into the winter, also threatens to deplete the foraging resource below a minimum sward height considered unprofitable for Barnacle geese to feed (Vickery & Gill, 1999), though again the threat in the immediate future is likely to be of a low-level. For Light-bellied Brent geese that prefer a short sward, the cessation of mowing at urban greenfield sites can quickly result in sites becoming unusable. In recent years there has been a trend for managing sections of parklands for pollinating invertebrates, which requires a reduced frequency of mowing to allow wildflowers to grow amongst longer grass (National Biodiversity Data Centre, 2015). Care should be taken to ensure a balance is achieved between positive conservation actions such as this and the requirements of the local Light-bellied Brent Goose populations that favour the same parklands.

Grazing by geese and swans has also led to conflict with some landowners who are unhappy at the loss of forage that was intended for livestock. Such conflicts tend to be localised in Ireland and pale in significance compared to the high levels of conflict on the island of Islay in Scotland, where the financial impacts of estimated agricultural damage have risen greatly over the last 20 years as goose numbers have increased dramatically to over 50,000 (mostly Barnacle Goose, smaller numbers of Greeland White-fronted Goose and Greylag Goose) (McKenzie & Shaw, 2017). In Ireland, agri-environment measures such as those available under GLAS (Green, Low-Carbon, Agri-environment Scheme) and the NPWS farm plan scheme provide financial supports to famers and landowners in many areas to manage their lands for the benefit of over-wintering geese. This does not always provide a solution however and deliberate scaring continues at some sites, often through the use of gas-bangers. Intentional scaring of geese and swans, although not necessarily common, is widespread throughout their respective wintering ranges in Ireland. Disturbance results in increased energy expenditure as the birds seek refuge and suitable feeding habitat elsewhere. Depending on the availability of habitat in the wider area, this could potentially be very energetically costly for birds attempting to build resources over the winter and in advance of migration. At present this is deemed a low-level pressure for these goose (White-fronted, Brent, Barnacle, Greylag) and swan (Whooper, Bewick's) species in Ireland.

5.7 Urbanisation and development

Given that many of Ireland's coastal and inland wetlands are located close to centres of human settlement and industry, pressures and threats from land use (primarily habitat loss and habitat fragmentation) exist and may increase in the future. For example, figures from the 2016 census published by the Central Statistics Office revealed that 1.9 million people, or 40% of the Irish population, reside within 5km of the coast, and of these, some 40,000 people live less than 100 metres from the nearest coastline. Major cities such as Dublin, Cork, Limerick and Galway are located beside major coastal wetlands of international importance, and key pressures and threats are likely to be related to infrastructure development such as roads, port developments, industry and flood defence schemes (note that flood defence schemes are considered further under 'climate change' above).

Implementation of the European Union (EU) Birds and Habitats Directives has resulted in the creation of a comprehensive network of sites for habitat and species protection, the Natura 2000 network. Where plans or projects have the potential to impact these sites, provisions arising from Articles 6 (3) and (4) of EU Council Directive 92/43/EEC (Habitats Directive) and transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations S.I. No 477 of 2011 (Appropriate Assessment) come into play, aiming to establish whether a proposed plan or project either alone or in combination with others, could have significant negative effects on a Natura 2000 site, in view of the site's conservation objectives. In the future it is likely that more projects will pass to Stage 4 of this assessment, where compensatory measures to effectively offset the damage to the Natura site will be

necessary. Across all assessments, the challenge remains to adequately assess cumulative (in-combination) impacts with the necessary robustness.

Note that the current assessment relates to the period 2008-2013 only (as per reporting under Article 12 of the Bird's Directive). Currently development of land is considered to pose a medium-level threat to Greenland White-fronted Goose and Light-bellied Brent Goose, particularly applicable where urban green spaces used for foraging may be developed (in the case of Light-bellied Brent Goose), or where housing developments may disturb flocks of Greenland White-fronted geese.

5.8 Water quality

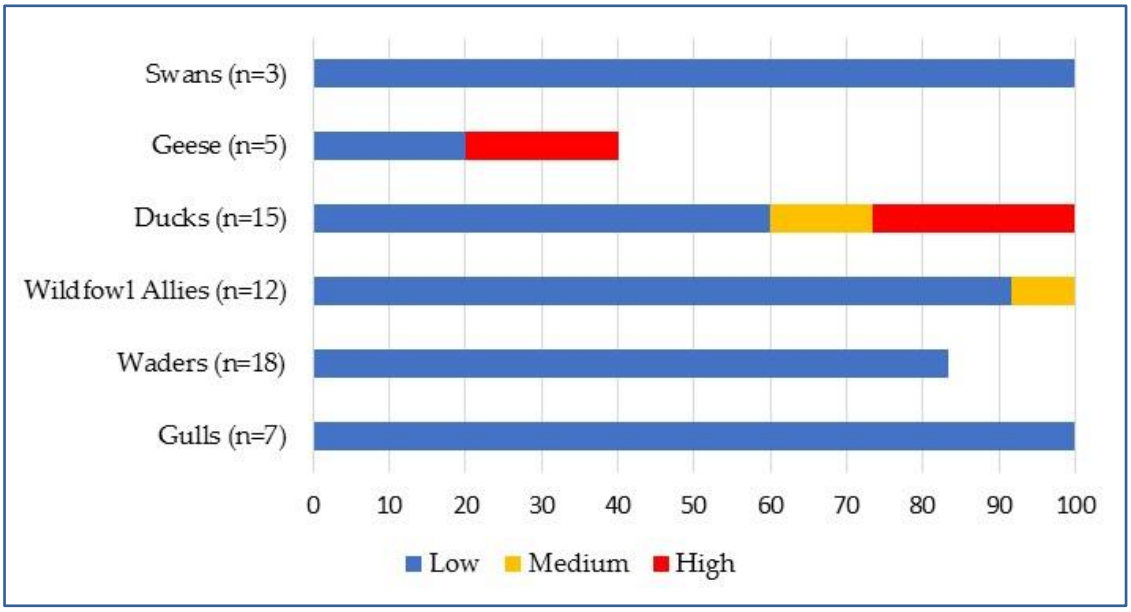


Figure 81 The proportion of each species grouping affected by water quality (all pressures combined). The pressure/threat is ranked as high, medium or low.

5.8.1 Mixed source water pollution

This category includes all types of marine pollution including agricultural and urban sources and the threat of oil spills. This is currently considered a low-level pressure and threat to Ireland's wintering waterbirds. The one exception is in the case of the Greenland White-fronted Goose. Wall *et al*. (2016) highlight the possibility and risk of future incidents of marine water pollution in Irish waters. Such an incident near Wexford could potentially result in the majority of the Irish flock of Greenland White-fronted Goose being exposed to, for example, an oil spill, when at roost. This would have a significant impact on the Irish and global population. For this reason, this risk is classified as a high-level threat.

5.8.2 Eutrophication – freshwater bodies

Eutrophication, which is caused by nutrient enrichment, remains the most significant issue for surface waters in Ireland (Wall *et al*., 2016). The most recent report on the water quality in Ireland (Trodd & O'Boyle, 2018) found that a quarter of rivers and lakes are failing in this environmental quality assessment criteria. High levels of phosphorus in the north-east of the country are impacting on lake water quality, while high nitrogen concentrations in the south and south-east are impacting on the quality of many of our estuaries.

Over a quarter of lakes and rivers have average phosphate and phosphorus concentrations (respectively) above what is considered the limit for 'good' ecological status. High levels of these

nutrients impact the ecological health of the water body in question by stimulating excessive plant growth with resulting knock-on effects for macroinvertebrate fauna, fish and waterbirds. In Ireland the main sources of excessive amounts of phosphates in water bodies are industrial and sewage discharges, as well as through the application of animal manure and inorganic fertilisers to agricultural lands.

Eutrophication of freshwater bodies is considered to pose a high-level pressure and medium-level threat to four waterbird species namely, Goldeneye, Pochard, Scaup and Tufted Duck; and a medium-level pressure and threat to Coot and Gadwall.

The pathways by which nutrient loading affects waterbird communities in freshwater systems are similar to those in coastal waters, although diffuse sources (especially agricultural run-off) may be relatively more important, as point sources are less prevalent at freshwater sites (Pringle & Burton, 2017). Møller and Laursen (2015) explored long-term associations between changes in fertiliser use and winter population indices of 50 freshwater and coastal waterbird species across Europe. The numbers of 14 species were positively related to fertiliser use, while numbers of 36 species showed negative relationships with fertiliser use. Freshwater systems, and shallow lakes in particular, may be more sensitive to changes in nutrient loading than coastal systems, due to lower flushing and dilution of the system (MacDonald, 2006). Declines in waterbird numbers have at least been partially attributed to eutrophication of freshwater habitats. For example, high levels of nutrient input at Lough Neagh and Lough Beg SPA in Northern Ireland were implicated in the decline of wintering diving duck populations at the site. Previous studies suggested that the nutrient input caused hyper-trophic conditions, with detrimental effects on the chironomid larvae that constitute the major dietary component for Pochard, Scaup, Tufted Duck and Goldeneye (e.g. Maclean *et al*., 2006). However, climate change and migratory short-stopping are now also considered a contributing factor to the observed declines in wintering numbers at this SPA (Tománková *et al*., 2013).

5.8.3 Eutrophication – coastal waters

The most recent report on the water quality in Ireland (Trodd & O'Boyle, 2018) found that a significant proportion of sites are affected by nutrient enrichment; a third of estuaries and coastal waters are failing environmental quality assessment criteria. Nearly a third of estuaries and coastal water bodies exceeded established nitrogen thresholds (winter dissolved inorganic nitrogen; DIN) and 18 of the 102 estuaries and coastal water bodies assessed from 2014 to 2016 were eutrophic or partially eutrophic. High levels of these nutrients impact the ecological health of the water body in question by stimulating excessive plant growth with resulting knock-on effects for macroinvertebrate fauna, fish and waterbirds. In Ireland the main sources of excessive amounts of phosphates in water bodies are industrial and sewage discharges, as well as through the application of animal manure and inorganic fertilisers to agricultural lands.

For the period being assessed, eutrophication of coastal waters is considered to be a low-level pressure and threat to Ireland's waterbirds.

One of the obvious signs of eutrophication of Irish estuaries is increased primary productivity and excessive growth of green macroalgae (*Ulva* spp.). Green macroalgal blooms or 'mats' generally develop in spring, persist throughout the summer and continue to cover intertidal flats into late autumn and early winter before decaying or being broken up by storms. At low cover and biomass, negative effects upon mud-dwelling macroinvertebrates appear negligible, with some invertebrate species being attracted into the algae themselves as epifauna (e.g. Raffaelli *et al*., 1998). At high algal cover and biomass however, most burrowing mud dwellers are inhibited while hypoxic or anoxic conditions can occur at the mud-weed interface. The knock-on effects upon foraging waterbirds are complex. While the macroalgae may be a food source for herbivorous species such as Wigeon or Light-bellied Brent Goose, some studies have shown waterbird distribution to be negatively correlated with algal mat coverage (e.g. Cabral *et al*., 1999; Raffaelli, 1999; Lewis *et al*., 2014). In particular, wading birds appear to be affected differently based on their foraging strategies and prey preferences. An

Irish study found that Redshanks may be constrained in obtaining their required daily energy intake on algal covered mudflats in contrast to Black-tailed Godwits that appear to not be adversely affected (Lewis *et al*., 2014).

5.8.4 Cessation of sewage discharges

While organic enrichment and the resulting macroalgal mats may have some deleterious effects on certain waterbird species, organic enrichment, fuelled by emissions from waste water treatment plants and combined sewer overflows (CSOs), may have served to benefit many foraging waterbirds due to proliferations of macroinvertebrates, principally detritivores, close to the locations of discharges (e.g. Lewis *et al*., 2002; Alves *et al*., 2012). While many areas around Ireland still require upgrades to existing waste water treatment plants, over time many estuaries are likely to have reductions in the amount of organic nutrients entering them as improvements are made. This is likely to lead to reductions in the macroinvertebrate prey base, at least in parts of the site where they had previously flourished due to enrichment (Lewis & Kelly, 2012). Such implications of improvements to waste water treatment have been noted previously (e.g. Burton *et al*., 2002), as have a reduction in bird numbers. A more recent review of the literature by Pringle & Burton (2017) identified a number of studies that had investigated the effects of nutrient loading of coastal waders on bird communities. Although results from many studies were correlative rather than causative, they do suggest that the effects of changes in water quality are somewhat site- and species-specific in many instances, but may lead to, and have been implicated in, both waterbird population increases and declines. Given that nutrients, in particular phosphorus, can be stored in sediment, reversal of the effects of eutrophication is likely to take considerably longer than the time over which the effects of eutrophication built up (Møller and Laursen, 2015), and hence improvements to organic loading is considered a future threat to waterbirds (their numbers and distribution), at least at some sites. The threat is considered to be of medium-level and the species likely to be affected are: Bar-tailed Godwit, Black-tailed Godwit, Curlew, Dunlin, Grey Plover, Knot, Redshank, Ringed Plover, Purple Sandpiper and Turnstone.

5.9 Others

5.9.1 Avian influenza

Avian influenza is a disease of birds caused by a Type A influenza virus. Most of these viruses cause either no clinical disease or only mild symptoms in the infected birds and are called Low Pathogenic Avian Influenza (LPAI). These LPAI strains are not unusual in waterfowl (ducks, swans and geese) around the world. However, a characteristic of the influenza virus family is their ability to mutate rapidly and for new strains to appear. Some of the mutants have the ability to cause more severe disease and these are called Highly Pathogenic Avian Influenza (HPAI), an example of which is the highly pathogenic H5N1 strain which arose in Southeast Asia and resulted in an epidemic between 2002 and 2006 (DAF, 2006).

In Ireland, there were outbreaks of highly pathogenic avian influenza in winters 2016/17 (strain H5N8) and 2017/18 (strain H5N6). The outbreak of H5N8 was first recorded in a dead Mute Swan in Hungary in October 2016. It subsequently spread west through much of Europe and was first recorded in Ireland in December 2016. Wigeon, Whooper Swans, Mute Swan and Grey Heron in counties Wexford, Cork, Tipperary, Roscommon, Leitrim and Galway were subsequently found to have died from this strain of flu. Owners of poultry flocks were required to confine all poultry and captive birds in a secure building in the months following the first recorded case in a wild bird to minimise the risk of commercial flocks contracting the flu. These measures were lifted in April 2017 and no commercial bird flocks in Ireland contracted avian influenza from wild birds. The H5N6 outbreak the following year was restricted to raptors – a White-tailed Eagle and Buzzard in Tipperary and another White-tailed Eagle in Clare. Two Greylag Geese were found to have died of bird flu (H5N6) in Armagh in

Northern Ireland in June 2018 also. It is highly likely that the true number of birds lost to these avian flu outbreaks was underestimated, though the overall impact was less than feared.

It is generally the case that such highly pathogenic strains of avian influenza evolve and spread in domestic poultry in Asia in the first instance (e.g. H5N8 in 2014/15; The Global Consortium for H5N8 and Related Influenza Viruses 2016). The resultant strains of avian influenza are subsequently brought to Europe by migratory waterbirds moving westwards in autumn and winter (Gilbert *et al*., 2006; The Global Consortium for H5N8 and Related Influenza Viruses 2016). Future epidemics of highly pathogenic avian influenza may pose a threat to all waterbird species in Ireland, particularly where outbreaks occur at sites with a large number and diversity of waterbirds (e.g. Dundalk Bay, Dublin Bay, Wexford Harbour, Cork Harbour, Shannon Estuary, Lough Swilly etc). The Department of Agriculture have an early warning system in place, together with the National Parks and Wildlife Service, BirdWatch Ireland and the National Association of Regional Game Councils, with regard to surveillance for signs of disease in wild birds in the Republic of Ireland.

5.9.2 Invasive alien species

Common Cord-grass *Spartina anglica* is a perennial saltmarsh grass that is the product of a hybridisation event that occurred on the south coast of England some 100 years ago (McCorry *et al*., 2003). Being more vigorous than its parents, the grass rapidly colonised coastal areas and stabilised mudflats. Its potential use as a tool to reclaim mudflats led to the grass being planted on many sites around the coasts of Britain, Ireland and Northern Europe during the 1920s. Common Cord-grass was first planted in 1925 in Cork Harbour (Cummins, 1930) and subsequent plantings occurred along many other coastal stretches. A number of negative impacts of this introduction were subsequently identified however (Stokes *et al*., 2004). The spread of *S. anglica* on coastal mudflats and saltmarsh results in a less diverse, monospecific sward and reduces both the intertidal feeding area and invertebrate prey base for foraging waders and other birds as it matures (Stokes *et al*., 2004), as well as causing the loss of macroalgae and eelgrass (e.g. *Zostera* spp.) beds which may impact waterfowl including Light-bellied Brent Geese and Wigeon (Robinson & Colhoun, 2006; Percival *et al*., 1998). However in some areas the grass has been observed to provide shelter and roosting areas for some bird species (e.g. Redshank, Snipe).

The spread of Common Cord-grass is listed as one of the three main threats upon Atlantic Saltmarsh, an Annex I habitat (McCorry & Ryle, 2009). However some studies and observations suggest that negative impacts may not be as serious as previously predicted and the spread of the species and subsequent effects appear to vary on a site by site basis. There are some concerns that *S. anglica* may benefit from warmer spring temperatures as a result of climate change (Nehring & Hesse, 2008).

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Appendix 1 – Participant counters

We extend sincere thanks to all of the following I-WeBS counters who have participated in the scheme over the past 25 years (apologies to those we may have inadvertently omitted).

K. Abariute
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J. Adamson
T. Adcock
A. Aherne
S. Alcorn
A. Allen
D. Allen
G. Anderson
P. Anderson
F. Ar Moenner
E. Archer
B. Arthurs
A. Ash
W. Atkinson
C. Ayres
J. Baer
B. Balcombe
R. Bamford
E. Bannon
G. Bareham
E. Barry
P. Bartlett
C. Barton
M. Beardsworth
I. Beatty
M. Bell
L. Benson
M. Berney
D. Berridge
S. Berrow
T, Berry
S. Biggane
A. Bingham
K. Bismilla
B. Black
J. & J. Bliss
H. Boland
R. Bono
H. Bothwell
N. Bourke
S. Bourke
J. Bowler
J. Bowman
A. Boyd
S. Boyd
H. Brazier
D. Breen
P. Breen
S. Breen
C. Brennan
D. Brennan
M. Brennan
N. Brennan
P. Brennan
S. Brien
P. Brittain
I. Brophy
J. Brophy
A. Brown
S. Brown
B. Browne
J. Bruce
M. Bryan
D. Buckley
W. Buis
N. Bugler
A. Burke
B. Burke
P. Burke
T. Burkitt
A. Burns
R. Busby
A. Butler
G. Butler
C. Byrne
E. Byrne
J. Byrne
P. J. Byrne
M. Byrnes
D. Cabot
B. Caffrey
J. Cahill
S. Callaghan
T. Campbell
V. Campbell
R. Cannon
P. Capsey
J. Carey
M. Carey
M. Carmody
B. Carrick
J. Carroll
T. Carruthers
D. Carty
E. Carty
H. Carty
V. Cashera
A. Casey
C. Casey
K. Casey
M. Casey
S. Casey
M. Cashman
C. Cassidy
G. Cassidy
J. Cassidy
M. Cassidy
T. Chadwick
P. Chandler
C. Chipperfield
D. Clabby
D. Clancy
P. Clancy
D. Clarke
C. Clenaghan
G. Clerkin
C. Clotworthy
M. Cobley
K. Colgan
K. Colhoun
M. Collier
D. Collins
J. Collins
K. Collins
N. Collins
R. Collins
J. Coman
D. Comerford
J. Concannon
J. Conneely
C. Connolly
E. Connolly
F. Connolly
M. Connolly
C. Conroy
J. Conroy
B. Convery
D. Cooke
D. Coombes
T. Cooney
A. Couper
A. Copland
J. Copner
W. Cormacan
J. Cornish
S. Corry
P. Cosgrove
M. Cotter
D. Cotton
D. Coveney
J. Coveney
M. Cowming
S. Cox
D. Craig
K. Craig
S. Craig
J. Crawford
J. Cribbon
N. Cribbon
J. Croke
J. Cromie
J. Cronin
J. Crosher
F. Cross
C. Croton
O. Crowe
C. Crowley
M. Crowley
R. Crowley
S. Crowley
P. Crushell
T. Cuffe
C. Cullen
D. Cullen
S. Cullen
A. Cummins
S. Cummins
C. Cunningham
M. Cunningham
J. Curtin
J. Curtis
J. Cusack
B. Coussen
A. Dale
E. Dale
D. Daly
G. Daly
P. Dansie
G. D'Arcy
C. Darling
D. Ellis
H. Davey
M. Davis
P. Davis
L. De Beer
T. De Beer
E. De Milo
J. Deasy
C. Deasy O'Leary

H. Deenan
K. Deering
A. Delaney
E. Delaney
H. Delany
S. Delany
B. Denny
P. Denny
L. Desierdo
D. Devlin
J. Devlin
J. M. Dick
D. Dillon
D. Dodrill
C. Doherty
T. Doherty
A. Donaghy
D. Donnelly
J. Donnelly
O. Dooley
R. Dooley
J. Doolin
K. Dooney
E. Doran
P. Dower
F. Doyle
H. Doyle
K. Doyle
L. Doyle
P. Doyle
S. Doyle
T. Doyle
P. Drennan
M. Dromey
N. Duff
B. Duffy
M. Duffy
P. Duffy
A. Duggan
D. Duggan
M.A. Duggan
S. Duignan
J. Dunleavy
O. Dunlevy
G. Dunn
A. Dunne
D. Durell
T. Durkan
M. Durkin
J. Durrant
P. Dwan
A. Dwyer
M. Eakin
R. Edwards
C. Egan
S. Egan
J. English
A. Englund
I. Enlander
M. Enright
S. Enright
D. Fabby
L. Fasola
L. Fahy
D. Fallon
D. Farrar
A. Farrell
S. Farrell
P. Farrelly
K. Fedrowitz
L. Feeney
S. Feeney
R. Fennelly
S. Fennelly
D. Finch
D. Finlayson
D. Finnamore
B. Finnegan
M. Finnegan
P. Finnegan
T. Finnen
K. Finney
N. Fitzgerald
P. Fitzgerald
A. Fitzpatrick
D. Fitzpatrick
F. Fitzsimons
M. Flaherty
P. Flanagan
B. Flavin-Dunphy
A. Fleming
U. Fleming
D. Flett
L. Floyd
F. Flynn
C. Flynn
D. Flynn
J. Flynn
C. Foley
J. Foley
O. Foley
P. Foley
S. Forde
C. Forkan
B. Forristal
D. Foulkes
J. Fox
M. Fox
M. & J. Fox
E. Foyle
G. Franck
S. Franck
K. Freeman
J. Freestone
B. Friel
P. Fuentes
C. Gallagher
L. Gallagher
T. Gallagher
H. Galvin
T. Gannon
S. Gardiner
J. Gatins
P. Gaughran
M. Gawley
J. Gibson
E. Giddy
I. Gillespie
C. Gilligan
N. Gilligan
J. Gilsenan
T. Gittings
E. Glanville
P. Gleeson
M. Glynn
T. Goodman
R. Goodwille
G. Gordon
J. Gordon
P. Gordon
T. Gordon
B. Gormley
P. Graham
R. Graham
N. Gray
J. Greene
A. Greer
B. Gregg
M. Grehan
L. Griffin
T. Griffin
M. Gunn
T. Gunn
M. Guthrie
S. Guthrie
M. Hackett
P. Hadland
F. Halbert
S. Haloran
P. Hamill
C. Hamilton
J. Hamilton
M. Hanafin
L. Hankey
T. Hannigan
C. Hannon
G. Hannon
M. Hannon
M. Hansen
B. Haran
G. Hardwicke
A. Harford
P. Harford
H. Harkness
N. Harmey
B. Harris
D. Harris
R. Hart
J. Hassett
S. Hassett
N. Hatch
J. Hayes
S. Hayes
B. Hayhow
D. Healy
F. Healy
C. Heardman
C. Heaslip
S. Heery
L. Heffernan
M-L. Heffernan
B. Hegarty
J. Hehir
M. Helmore
J. Hennigan
F. Henry
G. Heverin
G. Higgins
J. Higgins
K. Higgins
P. Higgins
C. Hill
I. Hill
J. Hobbs
D. Hogan
M. Hogan
P. Hogan
S. Hogan
D. Hogg
K. Hogg
R. Holloway
C. Holt
P. Holt
C. Honan
J. Hopkins
H. House
J. Hudson
J. Hughes
G. Hunt
J. Hunt
T. Hunter
J. Hurley
S. Hushen
H. Hussey
C. Hutchinson

C. & L. Huxley
C. Ingham
S. Ingram
K. Ireland
J. Ivory
A. Jacques
P. Jago
A. Jeffrey
B. Johnston
E. Johnston
S. Jones
V. Jones
K. Kane
L. Kane
B. Kavanagh
J. Kavanagh
T. Kavanagh
T. Kealy
M. Keane
P. Keane
P. Kearney
E. Keegan
V. Keenan
P. Keirns
J. Keleman
D. Kelleher
K. Kelleher
A. G. Kelly
C. Kelly
D. Kelly
F. Kelly
J. Kelly
K. Kelly
P. Kelly
S. Kelly
T. Kelly
W. Kelly
T. Kenneally
A. Kennedy
D. Kennedy
M. Kenny
J. Keoghan
N. Keogh
M. Kerrane
W. Kiefel
A. Kiely
J. Kilroy
B. King
C. King
F. King
M. Kingdon
K. Kinsella
J. Kirby
N. Kirby
A. Kitchen
W. Koepke
T. Kosgahakumbura
C. Kretsch
C. Kubernat
B. Laheen
C. Lalor
A. Lambe
A. Lauder
M. Lavery
O. Lavery
J. Law
R. Leak
S. Ledwith
P. Leigh Doyle
L. Lenehan
L. Lenihan
J. Lennon
L.J. Lewis
D. Litster
T. Little
I. Logan
L. Long
M. Long
S. Louis
J. Lovatt
R. Lundy
J. Lusby
A. Lynch
J. Lynch
P. Lynch
P. Lynders
L. Lyne
D. Lyons
D. Lysaght
L. Lysaght
P. Lysaght
S. Lysaght
R. MacCarthy
R. MacGillycuddy
K. Mackie
K. Macklin
M. Macklin
C. MacLochlainn
G. MacLochlainn
B. Madden
K. Madden
B. Magee
J. Magee
E. Magee
M. Maguire
P. Maguire
J. Maher
M. Mahony
C. Malone
J. Malone
D. Manley
R. Mann
S. Manning
F. O'Marcaigh
N. Marples
J. Marsh
D. Marshall
A. Martin
B. Martin
P. Martin
M. Masterson
R. Mathers
J. Matthews
M. Matthews
M. Maunsell
E. Mayes
L. McAlavey
P. McAlinney
S. McAvoy
G. McCaffrey
S. McCaffrey
S. McCanny
P. McCarron
A. McCarthy
R. McCarthy
S. McCleary
G. McCormack
M. McCormack
T. McCormack
E. McCormick
M. McCorry
T. McCoy
P. McCrossan
N. McCulloch
L. McDaid
P. McDaid
L. McDaniel
P. McDermot
A.M. McDevitt
T. McDevitt
D. McDonagh
D. McDonald
R. McDonald
A. McDonnell
M. McDonnell
P. McDonnell
A. McElheron
G. McElwaine
L. McEnroe
F. McGabhann
G. McGann
L. McGarry
G. McGeehan
S. McGinty
B. McGrath
D. McGrath
E. McGreal
P. McGroary
C. McGuire
D. McIntyre
S. McKee
S. McKeever
E. McKenna
M. McKenna
M. McKenna
C. McKeon
M. McKiernan
D. McLaughlin
E. McLoughlin
M. McLaughlin
R. McLaughlin
D. McLoughlin
V. McLoughlin
D. McMahon
F. McMahon
F. McManus
J. McNally
P. McNally
D. McNamara
S. McNamara
C. McNamee
R. MacNaughton
B. McPolin
P. McQuinn
B. McTiernan
P. McVicar
E. McWilliams
M. McWilliams
J. Meade
S. Meaney
A. Mee
T. Mee
B. Meehan
C. Meehan
C. Mellon
C. Merne
O. Merne
R. Merne
E. Meskell
B. Meyler
R. Millar
S. Millar
R. Mills
L. Milne
P. Milne
J. Milroy
J. Mitchell
M. Mitchell
N. & K. Mitchell
J. Mohan
S. Moles
A. Molloy
F. Molloy
D. Moloney

H. Moloney
M. Moloney
J. Monaghan
E. Mooney
M. Mooney
J. Moore
P. Moore
V. Moore
C. Mora
P. Moran
N. Morgan
P. Morgan
M. Morris
A. Mortimer
P. Mulhern
K. Mullarney
S. Mullins
R. Mundy
B. Murphy
C. Murphy
D. Murphy
F. Murphy
G. Murphy
J. Murphy
M. Murphy
O. Murphy
P. Murphy
E. Murray
S. Murray
T. Murray
G. Murtagh
T. Murtagh
T. Nagle
R. Nairn
P. Neavyn
D. Nesbitt
S. Newton
M. Ni Ceallaigh
T. Ni Fhloinn
A. Ni Shuilleabhain
R. Nigfhlionn
A. Nolan
J. Noonan
T. Nowlan
L. Nuttall

R. Ó Béarra
S. Ó Faoláin
T. O Rourke
J. O'Boyle
C. O'Brien
D. O'Brien
E. O'Brien
I. O'Brien
J. O'Brien
L. O'Brien
T. O'Brien
M. O'Clery
M. O'Coilleain
B. O'Connell
D. O'Connell
J. O'Connell
M. O'Connell
P. O'Connell
A. O'Connor
B. O'Connor
D. O'Connor
F. O'Connor
J. O'Connor
K. M. O'Connor
A. O'Dónaill
C. O'Donnell
D. O'Donnell
G. O'Donnell
P. O'Donnell
A. O'Donoghue
B. O'Donoghue
P. O'Donoghue
T. O'Donoghue
S. O'Donoghue
F. O'Donovan
G. O'Donovan
J. O'Donovan
R. O'Driscoll
F. O'Duffy
P. O'Dwyer
C. O'Gibne
P de C. O'Grady
J. O'Halloran
S. O'Hehir
D. O'Higgins

D. O'Keefe
G. O'Keefe
M. O'Keefe
C. O'Keeffe
D. O'Keefe
K. O'Leary
P. O'Leary
B. O'Loughlin
D. O'Loughlin
B. O'Mahony
C. O'Mahony
D. O'Mahony
M. O'Mahony
L. O'Malley
N. O'Malley
O. O'Maolin
M. O'Meara
C. O'Neill
F. O'Neill
F. O'Reilly
M. O'Reilly
K. O'Rourke
D. Osborne
B. O'Shea
P. Osterrieth
D. O'Sullivan
L. O'Sullivan
M. O'Sullivan
O. O'Sullivan
P. O'Sullivan
R. O'Sullivan
D. O'Teangana
L. O'Toole
S. O'Toole
F. Owens
G. Owens
J. Palmer
G. Pearson
C. Peppiatt
D. Perry
K. Perry
B. Phalan
A. Phillip
P. Phillips
G. Phipps

S. Pierce
M. Pollitt
C. Pollock
B. Porter
S. Powell
B. Power
G. Power
J. Power
F. Prendergast
P. Price
A. Prins
G. Prole
E. Quinn
F. Quinn
H. Quinn
J. Quinn
P. Quinn
S. Quinn
N. Raftery
V. Raine
T. Ramage
P. Reaney
S. Redican
T. Reed
D. Rees
S. Rees
E. Regan
B.Reidy
D. Reidy
M.Reilly
M. Reilly
P. Reynolds
M. Ridgeway
A. Robb
B. Robson
M. Roche
P. Rocke
T. Roderick
J. Roe
G. Rogan
J. Rogers
S. Ronayne
N. Rooney
A. Rosner
D. Roycroft

K. Ruge
B. Ryan
D. Ryan
F. Ryan
L. Ryan
M. Ryan
P. Ryan
S. Ryan
T. Ryan
C. Saich
D. Scanell
D. Scott
G. Scott
L. Scott
C. Seale
J. Shackleton
J. Shannon
M. Sharkey
N. Sharkey
J. Sharma
M. Sheehy
L. Shelley
H. Shepherd
E. Sheppard
R. Sheppard
P. Sheridan
A. Sherington
T. Shevlin
C. Shiel
J. Shine
C. Shoebridge
M. Shorten
J. Shorten
D. Silke
J. Simms
D. Skehan
J. Small
P. Smiddy
A. Smith
J. Smyth
M. Somers
S. Somers
M. Souter
A. Speer
T. Spillane

B. Staniford
R. Steed
B. Stembridge
R. Stephens
R. Stirling
C. Stockdale
A. Stoney
D. Storey Branagh
B. Strickland
W. Stringer
D. Strong
L. Stuart
M. Styles
D. Suddaby
V. Swan
M. Swann
E. Sweeney
M. Sweeney
O. Sweeney
K. Tapp
T. Tarpey
P. Taylor
R. Taylor
T. Tedstone
R. Teesdale
M. ten Cate
A. Thomas
C. Thomas
G. Thomas
R. Thompson
M. Tickner
D. Tierney
N. Tierney
V. Toal
A. Toland
J. Toland
R. Tottenham
R. Towe
S. Travis
D. Treacy
M. Trewby
P. Troake
C. Tweney
P. Twomey
M. UiLéime
H. van Pesch
P. Vaughan
B. Vennemann
M. Viney
E. Virkki
Y. von Cramon
B. Waldron
B. Wall
E. Wallace
A. Walsh
P. Walsh
P. Walton
S. Walton
G. Ward
P. Warner
T. Waterman
S. & T. Waters
T. Watkins
B. Watson
P. Watson
R. Watson
A. Webb
J. Wells
D. Whaley
J. Whearty
F. Wheeldon
R. Wheeldon
J. Whelan
R. Whelan
J. Whilde
C. White
P. White
J. Whitla
T. Whyte
B. Wickham
G. Wilkinson
C. Williams
G. Williams
T. Williams
C. Wilson
G. Wilson
J. Wilson
M. Wilson
F. Wolstenholme
P. Wolstenholme
W. Woodrow
K. Woods
L. Woods
R. Woodward
P. Woodworth
J. Wray
M. Wright
J. Wyllie
A. Wynne
G. Young
M. Zajac

Appendix 2 – I-WeBS sites

The full list of I-WeBS sites mentioned in the report is given below. The central Irish grid reference of each site is provided.

County Carlow	
Slaney Upper	S895580
County Cavan	
Adra Lough	H300003
Annaghierin Lake	H700034
Annalee River	H6111
Bailieborough Lough	N671967
Barnagrow Lough	H670070
Billis: Ballyjamesduff	N560940
Bracklagh Lough	N395826
Castle Lough	N669990
Clonty Lake	H275123
Cornagrow Lough	N510932
Cornakilly, Virginia	N555861
Corraghy Lough	H690050
Corraneary Lough	H650052
Druminnick Lough	H688057
East Ballinamore Lakes	H200150
Evvey Lake Kingscourt	N763941
Galloncurra Lough: Bailieborough	N6396
Garty Lough: Arvagh	N279978
Glasshouse Lough	H270060
Green Lough	H425035
Guinikin Lough: Arvagh	N272966
Hollybank Lake: Arvagh	N265975
Kilmore Lough	N610917
Kilnaleck Lakes	N4389
Lisgrea Lough	N593899
Lisnananagh Lough	H495031
Lough Acurry	N585990
Lough Oughter Complex	H350070
Lough Ramor	N600860
Lough Sheelin	N450840
Lough Sillan	H700066
Lough Tacker	H690080
Lower Lough: Arvagh	N262980
Mass Rock Field (near Arvagh)	N300990
Milltown Lough (Cavan)	H710039
Mountnugent	N493851
Mullagh Lough	N680850
Nadreegeel Loughs	N550937
Parkers Lough: Bailieborough	N648972
River Erne & lakes north of Belturbet	H365195
River Erne: Oughter - Gowna	N360970
Rockfield Lake	H274035
Roosky Lough	H647045
Shinan Lough	H710050
Swellan Lough	H412040
Tullylorcan Lough	H635037
White Lough (near Shercock)	H669043
Woodford River	H243140
Woodford River Lakes	H300200
County Clare	
Ballinsheen Lough	R385945
Ballyallia Lake	R345810
Ballycar Lough	R414687
Ballyvelaghan Lake (Burren Village Lake)	M280113
Cahermurphy Lough	R099662
Carran Polje	R282980
Castlelough	R345980
Corofin Wetlands	R290890
Cregg Lough, Whitegate	R743890
Derrynacarragh Lough	R207778
Doo Lough	R120720
Dromoland Lough	R387757
Dromore Lakes (Clare)	R3586
Drumcliff	R330800
Farrihy Lough	Q914644
Gortaganniv Lough	R262759
Inagh River	R175840
Kilfenora	R180940

Kilkee Reservoir	Q900618
Knockaunroe/ Rinnamona	R310938
Lickeen Lough	R170910
Liscannor Bay (Liscannor - Rinanoughter)	R0886
Lough Atorick	R630965
Lough Girroge	R347797
Lough Graney	R556930
Lough Naminna	R176710
Lough O'Grady	R610840
Lough Raha	R267860
Mid-Clare Coast (Mal Bay - Doonbeg Bay)	R020750
Poulataggle	M403007
Pouleenacoona	M365018
Quin/Keevagh	R410756
River Fergus	R330890
River Shannon (Lower)	R640620
River Shannon (Lower) Aerial	R640620
Ruan Turlough	R3387
Scarriff area	R6480
Shannon & Fergus Estuary	R200520
Shannon & Fergus Estuary Aerial	R200520
South East Clare Lakes	R460720
Tulla Turlough	M360020
Tullaher Lough	Q955620
Turloughmore (Clare)	R345995
County Cork	
Adrigole Harbour	V805495
Argideen River	W330467
Ballin Lough	W200390
Ballybranagan	W9161
Ballybutler (Butlerstown) Lake	W9272
Ballycotton Shanagarry	W9865
Ballycrenane/Warren	X020683
Ballydehob Estuary	V990350
Ballyhea Gravel Pit	R538172
Ballyhonock Lough	W993733
Ballymacoda	X0672
Ballynacarriga Lake	W285503
Bandon Estuary	W600495
Bandon River	W370530
Bantry Bay	V990485
Barley Cove Bay	V770245
Bear Haven	V680455
Blarney Fen - Clogheenmilcon	W625755
Blarney Lake	W605745
Buttevant	R545135
Carrigillihy Lake	W212330
Castlemartyr Lake	W9672
Castlenalact Lake	W480600
Charleville Lagoons	R5426
Clonakilty Bay	W400380
Cloyne	W920670
Cork Harbour	W800666
Corran Lake	W220400
Courtmacsherry Bay, Broadstrand Bay & Dunworley	W515380
Croagh Bay	V900290
Crookhaven	V815265
Curraghlicky Lake	W235467
Farranamanagh Lough	V830377
Gallanes Lough, Clonakilty	W396431
Glandore Harbour/Union Hall	W210345
Ilen Estuary	W050290
Inishcarra Reservoirs	W330700
Kilcolman Marsh	R580109
Kilkeran Lake	W337340
Lissagriffin Lake	V770263
Lough Aderry	W9373
Lough Atarriff	W260460
Lough Cluhir	W200325
Lough Gal	W700750
Lough Gorm	W195394
Madame Lake (Bateman's Lough)	W407468
Mahona Lough	W232507
Myross Island & Inlet (Blind Harbour)	W205313
Nohoval Lake	W718506
Ringabella Creek	W7656
Roaringwater Bay	W001307
Rosbrin Cove	V980315
Rosscarbery	W290360
Scart Bridge	R522150
Shreeland Lakes (incl. Lough Doo)	W178359
Stick Estuary (Oysterhaven)	W680510
Toon River Callows, Parkanillane	W290702

Toormore Bay	V855300
County Donegal	
Ballyness Bay	B910330
Black Lough, Carrowmeenagh	C569435
Cashelnagor Lough	B922259
Clooney Lough	G720990
Culdaff	C533494
Donegal Bay	G890730
Doon Lough	G703980
Drimagraa Lough	G855828
Dunfanaghy Estuary	C010370
Dunfanaghy New Lake	C020380
Dunlevy Lough	B915195
Fanad North Coast	C190445
Gartan Lough	C050158
Glencoagh Lough	G865790
Gweebarra Bay	G780994
Kiltooris Lough	G675975
Kindrum Lough	C185430
Kinny Lough	C204442
L. More (Creeslough)	C064307
L. Natooey	C148303
Lettertreane Lough	G887840
Lough Acapple	G998671
Lough Adrihidbeg (Dungloe)	B780111
Lough Alaan	H153960
Lough Bhaile na Creige	B907289
Lough Birroge	G695985
Lough Derryduff	G745970
Lough Doo, Buncrana	C359394
Lough Effish	L573438
Lough Fad	G725980
Lough Fern	C180230
Lough Finn	B910014
Lough Foyle	C530330
Lough Illion	B747094
Lough Inn	C517387
Lough Nacung Upper	B890210
Lough Namafin	G800839
Lough Naminn	C398418
Lough Shivnagh	B955028
Lough Shivnagh (Tully)	H005673
Lough Swilly	C300250
Loughanvrickabrack	C463367
Loughs Akibbon & Nacally	C060180
Magheradrumman Lough	C205450
Maghery Lake	B722095
Meenaguse Lough	G903882
Mintiags Lough	C3840
Rath Lough	G965688
River Deele	H2598
River Finn	H2894
River Foyle	C350100
Rosapenna Lough	C112381
Sand Lough	B958207
Sandfield Lough	G708951
Shannagh Lough	C213453
Sheskinmore Lough	G695956
Still Lough	G703988
Summy Lough	G705970
Tamur Lough	G811858
Tawny Lough (Donegal)	C200389
Trawbreaga Bay	C440480
Trawenagh Bay	B780045
Trusk Lough	H130900
Tullinlough	G834850
County Dublin	
Baldoyle Bay	O240420
Broadmeadow (Malahide) Estuary	O220470
Delvin River - Hampton Cove	O200643
Dublin Bay	O210340
Dublin Zoo Ponds	O128355
Grand Canal (Dublin)	O138326
Hick's Tower & Robswall	O250435
Hynestown Lake Naul	O153601
Ireland's Eye	O290410
Knock Lake	O190610
Lambay Island	O315510
Rockabill	O322625
Rogerstown Estuary	O230520
Skerries Coast	O270575
Skerries Islands	O268598
Skerries, Baldongan	O225575
South Dublin Coastline	O270260
St Stephen's Green	O160335
County Galway	
Abbert River/Ardskea	M452420
Ballindeereen Turlough	M400150
Ballinduff Turlough & Grassland	M460070

Ballyboy	M481129
Ballyconneely Bay	L620430
Ballynaboola	S674099
Ballynakill Lake	L640582
Ballynakill Lough (Gorumna Isl.)	L865226
Bog SE of Lettershinna	L840420
Boggaun Lough	M733359
Caherglassaun Lough	M410060
Cahermore Turlough	M410080
Caranavoodaun Turlough	M450150
Carrowreagh	M715352
Castleboy Grassland	M513112
Cockstown West	M485103
Coolcam Turlough	M577710
Coole Lough - Newtown Turlough	M415030
Coollisduff	M222597
Corralough	M618694
Cregaclare (E of Ardrahan)	M483130
Creganna Marsh	M382225
Croaghill Turlough	M592710
Curragh Turlough	M565677
Doolough Headford (Turloughcor)	M290440
Dooyertha River	M55235
Flooded area E of Blindwell	M370597
Foxhall/Cloghans Hill	M335605
Glenamaddy Turlough	M635610
Gort	M455058
Gorteen	M535597
Grassland at Ardacong	M440549
Headford Road	M320320
Inishbofin	L550650
Inishmore, Aran Islands	L830110
Inner Galway Bay	M320180
Inner Streamstown Bay	L640525
Killaclogher River	M5640
Kiltiernan Turlough	M430140
Kiltullagh Lough	M6159
Knockatogher Turlough	M590270
Kylemore Lough	L770585
L. Coy - Blackrock - Bullaunagh - Ballylee	M495075
Loch na Créibhinne	L990215
Loch Ros Amhíl	L967252
Lough Adrehid	M052429
Lough Anillaun	L614582
Lough Aroolagh	L924383
Lough Aughawoolia	L971414
Lough Corrib	M270400
Lough Cutra - Ballynakill L.	R470965
Lough Illauntrasna (Gorumna Isl.)	L887254
Lough Mannagh Turlough	M400010
Lough Poll	M136291
Lough Rea	M610150
Loughaunavneen/Loch Tanaí (Camus)	L950305
Loughaunawarls	M489169
Lower Lough Corrib (swans)	M300350
Lydacan Castle Turlough	M440070
Mannin Bay	L620470
Mullaghmore	M6148
North Central Galway Lakes	M370580
North East Galway Lakes	M600480
Omey Strand	L575560
Owenbristy	M431121
Pollahalia (near Headford)	M328433
Polleagh Turlough	M575685
Pollnagarragh Marshes	M480160
Raford River	M6327
Rahasane Turlough	M480195
River Clare	M350330
Rossadillisk	L570585
Termon Turloughs	R410980
Tullaghnafrankagh Lough	M430150
Tully Lough (Inverin)	M004222
Un-named lake between Tulla & Clonteen	M385023
Waterdale (floodplain NW of Claregalway)	M368360
County Kerry	
An Trá Beg	Q485003
Ballinskelligs Bay	V4665
Brandon Bay - Inner Brandon Bay	Q530130
Cashen River & Estuary	Q870385
Castlemaine Harbour & Rossbehy	Q700000
Castlemaine Outer: Inch offshore	V6398
Crompaun River	Q853304

Dingle Harbour	Q4401
Kenmare Estuary	V9170
Lake Yganavan	V705995
Lixnaw Canal	Q8930
Lough Caragh	V7290
Lough Leane & Killarney Valley	V9587
Magharees Islands	Q6020
Mountain Lakes SW of Lough Leane	V830810
R. Laune	V808937
Smerwick Harbour	Q370050
Tralee Bay, Lough Gill & Akeragh Lough	Q700150
Ventry Harbour	V380990
County Kildare	
Ballynafagh Lake (Prosperous)	N810290
Balrath	N675605
Gilltown Bridge (nr Kilcullen)	N865065
Grasslands near Dunlavin (north of)	N863040
Kildare Curragh	N775135
Lakelands Naas	N895193
Pollardstown Fen	N7715
River Barrow (Monasterevin-Athy)	N660030
River Barrow (Monasterevin-Portarlington)	N610130
County Kilkenny	
Holly Lake (aka L. Cullin)	S613185
The Loughane (nr. Urlingford)	S317635
County Laois	
Ballycolla	S386827
Durrow Curragh (River Erkina)	S3778
Landfill Ponds N80 North of Portlaoise	N450033
River Barrow, Rathcoffey	N344123
River Barrow: Mountmellick (Clonterry)	N476092
River Nore	S402888
County Leitrim	
Acres Lake (Drumshanbo)	G967099
Annaghmaconway Lough	N131999
Ballinamore Lakes	H215100
Ballinamore/Ballyconnell Canal	H9906
Beaghmore Lough	N225987
Calloughs Lough	H226049
Carrigallen Lakes	H230033
Clooncorick Lough	H240044
Clooncose Lough	N180927
Cullies Lough	H260015
Cullies River (nr. Carrigallen)	H253020
Drowes River Bundrowes Bridge	G795585
Drumshanbo Lough	N148909
Dumb Lough	H255046
Eslin River	N055885
Fearglass Lough	N173919
Glencar Lough	G749434
Gortermone Lough	N216967
Gulladoo Lough	N240990
Keeldra Lough	N149962
Killananima	G813305
Kilnamar Lough	H259060
Laheen Lough	H260071
Lough Cam	H161038
Lough MacNean (Upper)	H040390
Lough Nabelwy	N191938
Lough Sallagh	N160914
Mullanadarragh Lough	H212014
North West Leitrim Mountain Lakes	G900400
Rinn Lough Wetlands	N100940
River Shannon Upper (Drumsna - Carrick-on-Shannon)	M958960
Shannon-Erne Waterway	G9604
Tully South Lough	N220977
County Limerick	
Annagh Lough (Longford)	N217923
Camoge River	R6243
Cordara Turlough	N030635
Doogary Lough	N205952
Fortwilliam Turlough	N015633
Gorteen Lake	N227795
Inny River	N2158
Leebeen Lough	N265893
County Longford	
Lough Forbes	N080820
Lough Gowna	N300900
Lough Gur	R6441
Lough Kinale & Derragh Lough	N390811
Lough Naback	N245945
Lough Ree	N020530

Morningstar River	R5836
Mungret	R530550
Rinn River	N088830
River Deel	R340430
Turreen Turlough	N018650
County Louth	
Boyne Estuary	O150770
Braganstown	O020943
Carlingford Lough (RoI)	J210106
Dunany Point - Clogher Head	O146880
Dundalk Bay	J106003
Dundalk Bay Outer (North: Ballagan Point - Giles Quay)	J232062
Fane River Plain	J040005
Keenan's Cross Pond	O0991
Killineer Quarry, Drogheda	O072760
Parsanstown, near Clogher Head	O130862
Port Oriel: Collon	N9882
River Glyde	O065945
County Mayo	
Achill Island	F6406
Attymass Lakes	G286126
Balla Wetlands	M260850
Ballybackagh	M250550
Ballyglass Wetlands	M225780
Ballyhaunis Lakes	M500850
Blacksod & Tullaghan Bays	F690250
Brees Wetlands	M310830
Broadhaven & Sruwadaccon Bays	F770350
Bulkan River	M201632
Callow Lakes	G313037
Carras Lough	M315625
Carrowmore Beach	L796816
Carrowmore Lake	F830300
Carrowmore Lough	M232885
Carrownacon Lakes	M200775
Cashel Turlough	M077833
Castlebar Lakes/ Islandeady chain	M090880
Clew Bay	L900900
Cloonagh Lough (Mayo)	G205218
Cuiltybo Lough	M335861
Derrymannin Lake	G214114
Doocastle Turlough	G5808
Doolough & Finlough	L835672
Garrets Lake	G106143
Gibson's Lough	M077931
Keel Lough	F650060
Kilglassan Turlough/ Greaghans	M280650
Killala Bay	G250300
Killaturly Lake	M411985
Kilnalag Turlough	M609696
Kinlooey Lough	M033816
Knappaghbeg Lough	M010805
Little River/Sraheens	M273905
Lough Alick	G214145
Lough Carra	M180710
Lough Conn	G180110
Lough Cullin	G230030
Lough Levally	G140045
Lough Mask	M110630
Lough Muck (Mayo)	G305032
Lough Nacapduff	G040122
Lough Nahaltora	L792743
Manulla Lakes	M208878
Mullet West	F620250
River Moy	G249121
River Robe (near Brikeens, E of N17)	M400730
River Robe (W of N17)	M3071
Robe River (near Roundfort)	M260660
Rostaff Lake	M250490
Shrule Turlough	M275520
Skealoghan Turlough	M250625
South Mayo Coast	L740750
Straide River	M268985
Tawnyard Lough	L915673
Termoncarragh & Annagh Marsh	F663350
Toormore River	M2395
Washpool Lough	M215841
Wetland near Drumcarrabaun (Belcarra/Ballyglass Road)	M203820
County Meath	
Balgeeth	N700728
Ballyhoe Lakes	N850950
Baltrasna	N527769
Black Lough (Drewstown)	N687684
Breakey Lough	N736902

Clooney Lough (Castletown)	N830820
Croboy Lough & fields	N622485
Crossakeel	N652736
Cruicetown	N790850
Donore Bog	O0470
Fordstown	N724698
Gravelstown	N780808
Kells (Meath)	N720724
Lough Bane	N550711
Lough Brackan	N8788
Moat, Oldcastle	N514804
Murphy's Quarry, Gormanston	O156686
Nanny Estuary & shore	O170700
Newcastle Lough	N795908
River Blackwater (Meath)	N755763
River Boyne	O007728
Tara Mines Tailings Ponds	N840710
Wetlands at Greenan/ Garrynabolie	N540740
White Lough	N692688
Whitewood Lough	N7988
Yellow River	N842744
County Monaghan	
Annaghmakerig Lough	H585205
Annagose Lough	H580250
Baraghy Lough	H6612
Bawn area	H7111
Blackwater Catchment	H710420
Carlougharoe Lough	H570225
Creeve Lakes	H7316
Creevy Lough (Monaghan)	H830070
Descart Lough	N822973
Dromore Lakes (Monaghan)	H620170
Dromore River	H690195
Drum Lakes	H560160
Drumgole Lough	H590190
Drumhay Lake	H580180
Drumillard Lake	H818213
Fane River	H874142
Finn-Lacky Catchment	H610340
Gortnawinny Lake	H5128
Inner Lough Dartrey	H6117
Killy Lough (Monaghan)	H630042
Killygola Lake	H8221
Lakelands	H773242
Lough Avaghon	H6813
Lough Egish	H7914
Lough Fea (Monaghan)	H8202
Lough Laragh	H800220
Lough Morne	H7613
Lough Nagarnaman	H820110
Lough Naglack	H855024
Lough Ross	H8816
Loughs Feagh & Drumate	H590226
Monalty Lough	H8602
Muckno Lough	H840200
Muckno Mill Lough	H842222
Newbliss	H563234
Rahans Lake	N832976
Rossmore Forest Park	H655310
Slieve Beagh Lakes	H560430
County Offaly	
Blackwater Railway Lake	N005260
Boora Lakes - Back Lakes Finnamores	N180195
Charleville Pond	N312225
Cloghanhill	N0919
Derryounce (Lough Lurgan)	N530148
ESB, Rhode	N506346
Little Brosna Callows	M970115
Little Brosna Callows (Aerial)	M970115
Pallas Lake	N275195
Raheen Lough	N465180
Shannon Callows	N000215
Shannon Callows (Aerial)	N000215
Turraun Nature Reserve	N178236
County Roscommon	
Annaghmore Lakes	M890840
Ballinagard (S. of Roscommon)	M872625
Ballintober East Turlough	M737748
Ballintober Turlough	M727747
Brideswell	M945455
Cartron Lough	M991952
Castleplunket Turloughs	M790780
Cavetown Lough	M831973
Drumalough	M633824
Farramagalliagh East Turlough	G877016
Feacle Turlough	M908434
Fields north of Bellagh Lough	M956947
Fin Lough (Roscommon)	G865040

Frenchpark	M743929
Grange Lough	M980870
Kilglass Lough	M980860
Kiltybranks	M595915
Lough Acrick	N012850
Lough Boderg	N015920
Lough Drumharlow	G910020
Lough Key	G8305
Lough Meelagh	G890120
Lough Skean	G860130
Lowfield Lough	M992946
Lung River	M6595
NW of Kilglass (adjoining L. Boderg)	M970860
River Suck	M800400
River Suck (Aerial)	M800400
Southern Roscommon Lakes	M880600
Stream/ grasslands near Clogher Bridge	M986943
Thomas Street Turlough	M865465
Tully Lough	M987919
Turlough South of L. Key	G870010
Wetland at Cloongasny Beg	M981895
Wetlands east of Elphin	M950880
County Sligo	
Ardnaglass River (nr Dunmoran)	G5234
Ardogelly (nr Aughris Hd)	G4934
Ballyconnell Bog	G570450
Ballygawley Lough	G695287
Ballysadare Bay	G620310
Brownstown (west of Easkey)	G340387
Bunduff Lakes	G710550
Bunnanaddan	G606112
Castleloye Turlough	G5413
Cloghcor	G602438
Cloonacleigha Lough	G610147
Cloonagh Lough (Sligo)	G582465
Colgagh Lough	G740360
Drumcliff Bay Estuary	G630430
Drumcliff River/Collinsford	G710410
Garvogue River	G708352
Knocknawhishoge	G689137
Leitrim South Turlough	G548115
Lough Anelteen	G765363
Lough Arrow	G790115
Lough Dargan (Sligo)	G724282
Lough Gara	M700980
Lough Gill	G750335
Mullaghgar (nr Lough Gill)	G750356
North Sligo Coast	G710580
Outer Sligo Bay	G560460
Owenmore River	G6608
Quarryfield W Turlough	G590104
Sligo Harbour	G650380
Templehouse Lake	G6117
Turlough W of Ballinvally	G570121
Unshin River	G704270
County Tipperary	
Ardcrony Turlough	R891873
Ballingarry	R9896
Cabragh Wetlands	S108552
Clover River	S215578
Drangan Beg	S030300
Field with stream near Ballinruddery	M908000
Flooded pasture, Ballinderry	R906908
Gortdrum	R870410
Grange: near Holycross	S065551
Lough Aran	R855940
Lough Derg (Shannon)	R800900
Lough Derg (Shannon) Aerial	R800900
Lough Duff	R905817
Lough Eorna	R880860
Lyonstown Stud Farm	S110365
Marlfield Lake	S170220
Pat Reddan's Lake	R890960
River Suir Middle	S050450
River Suir Upper	S133616
Rockwell College Lake	S070340
Walshs Sandpit Rathcool	S196385
County Waterford	
Ballinlough	S447035
Ballylough	S6504
Ballyscanlan Lake	S541030
Ballyshunnock Reservoir	S550020
Belle Lake	S663045
Blackwater Callows	W930990
Blackwater Estuary	X110800
Boatstrand-Annestown	X490989
Carrickavrantry Reservoir	S549022

Clonea Strand	X317942
Coolderry, Ballylusky	R920882
Dungarvan Harbour	X260920
Garrarus & Kilfarrassy	X535980
Kilmacomb (South of Belle Lake)	S658028
Kilmeaden Cream (Blackknock)	S5108
Knockaderry Reservoir	S495060
Lower Blackwater River	X100800
Mid-Waterford Coast	X4097
Outer Tramore Bay	X595995
Pouldrew Pond	S509115
River Barrow (Cheekpoint-New Ross)	S690190
River Bride	W975940
River Suir Lower	S500140
Tramore Back Strand	S615015
Waterford Harbour	S703070
Whiting Bay	X152777
County Westmeath	
Ballinlough (Westmeath)	N645658
Crowinstown Lough	N640640
Glen Lough	N282670
Grasslands near Ballynacarrigy	N287613
Lough Derravaragh	N410680
Lough Drin	N455568
Lough Ennell	N400465
Lough Glore	N490720
Lough Iron	N340630
Lough Lene	N510680
Lough Owel	N400580
Lough Sheever	N460554
Newtown Lough	N639680
Plunkett's Quarry, Castletown	N458779
Slevin's Lake	N451560
Tang River	N1653
Walshestown South Turlough	N400540
Waterstown Lough	N100455
White/Annagh Lough	N512730
County Wexford	
Bannow Bay	S820090
Cahore Marshes	T205450
Lady's Island Lake	T1006
River Slaney	S980310
Tacumshin Lake	T0506
The Cull & Killag (Ballyteige)	S930070
Wexford Bay	T115285
Wexford Harbour & Slobs	T060213
County Wicklow	
Arklow Ponds	T250744
Avoca River/Arklow	T240736
Bray Harbour	O270193
Buckroney Fen	T295808
North Wicklow Coastal Marshes	O310040
Poulaphouca Reservoir	O000100
Vartry Reservoir	O2002

Appendix 3 – Summary data for non-regularly occurring waterbirds

Summary table of I-WeBS data for all non-regularly-occurring waterbirds recorded during the period 2009/10-2015/16.

Species	Scientific name	Number of records 2009/10 - 2015/16	Number of seasons recorded 2009/10 - 2015/16	Number of sites 2011/12 - 2015/16	Peak Count 2011/12 - 2015/16
Black Swan	*Cygnus atratus*	39	7	8	6
Bean Goose	*Anser fabalis*	7	2	1	2
European White-fronted Goose	*Anser albifrons albifrons*	2	2	2	2
Bar-headed Goose	*Anser indicus*	23	3	1	1
Snow Goose	*Anser caerulescens*	10	4	3	1
Dark-Bellied Brent Goose	*Branta bernicla bernicla*	13	6	5	2
Brent Goose (Black Brant)	*Branta bernicla nigricans*	10	5	5	1
Egyptian Goose	*Alopochen aegyptiacus*	15	2	2	6
Ruddy Shelduck	*Tadorna ferruginea*	15	7	1	2
Muscovy Duck	*Cairina moschata*	66	3	1	1
Mandarin	*Aix galericulata*	19	5	2	16
American Wigeon	*Anas americana*	19	7	5	1
Green-winged Teal	*Anas carolinensis*	33	7	17	1
Baikal Teal	*Anas formosa*	1	1	0	0
Black Duck	*Anas rubripes*	2	2	0	0
Garganey	*Anas querquedula*	21	7	4	15
Blue-winged Teal	*Anas discors*	5	3	2	1
Ring-necked Duck	*Aythya collaris*	41	7	7	2
Lesser Scaup	*Aythya affinis*	1	1	1	1
Surf Scoter	*Melanitta perspicillata*	15	5	4	2
Velvet Scoter	*Melanitta fusca*	13	6	6	3
Ruddy Duck	*Oxyura jamaicensis*	4	3	2	1
Pied-billed Grebe	*Podilymbus podiceps*	2	2	1	1
Red-necked Grebe	*Podiceps grisegena*	18	6	4	3
Black-necked Grebe	*Podiceps nigricollis*	9	4	5	4
Bittern	*Botaurus stellaris*	3	2	1	1
Great White Egret	*Ardea alba*	8	3	3	1
Cattle Egret	*Bubulcus ibis*	2	2	1	1
Glossy Ibis	*Plegadis falcinellus*	14	6	8	20
Spoonbill	*Platalea leucorodia*	55	7	5	10

Species	Latin name	Number of records 2009/10 - 2015/16	Number of seasons recorded 2009/10 - 2015/16	Number of sites 2011/12 - 2015/16	Peak Count 2011/12 - 2015/16
American Coot	*Fulica americana*	5	2	2	1
Crane	*Grus grus*	8	3	3	5
Avocet	*Recurvirostra avosetta*	1	1	1	1
Dotterel	*Charadrius morinellus*	1	1	1	1
American Golden Plover	*Pluvialis dominica*	8	4	2	1
Semi-palmated Sandpiper	*Calidris pusilla*	2	2	2	2
Little Stint	*Calidris minuta*	28	7	6	3
White-rumped Sandpiper	*Calidris fuscicollis*	3	2	2	4
Pectoral Sandpiper	*Calidris melanotos*	6	3	2	2
Buff-breasted Sandpiper	*Tryngites subruficollis*	7	4	1	1
Long-billed Dowitcher	*Limnodromus scolopaceus*	1	1	1	2
Woodcock	*Scolopax rusticola*	22	7	8	4
Green Sandpiper	*Tringa ochropus*	55	7	18	27
Lesser Yellowlegs	*Tringa flavipes*	3	2	2	1
Wood Sandpiper	*Tringa glareola*	9	4	4	2
Wilson's Phalarope	*Phalaropus tricolor*	3	3	1	1
Grey Phalarope	*Phalaropus fulicarius*	1	1	1	1
Sabine's Gull	*Larus sabini*	2	2	1	3
Yellow-legged Gull	*Larus michahellis*	31	7	9	4
American Herring Gull	*Larus argentatus smithsonianus*	1	1	0	0
Ivory Gull	*Pagophila eburnea*	1	1	1	1
Sandwich Tern	*Thalasseus sandvicensis*	387	7	50	450
Roseate Tern	*Sterna dougallii*	17	6	5	27
Common Tern	*Sterna hirundo*	101	7	21	300
Arctic Tern	*Sterna paradisaea*	46	7	15	45
Common/ Arctic Tern	*Sterna sp.*	1	1	1	163
Forster's Tern	*Sterna forsteri*	5	4	2	1
Little Tern	*Sternula albifrons*	36	5	7	59
Black Tern	*Childonias niger*	8	3	3	4
White-winged Black Tern	*Childonias leucopterus*	2	2	2	1
Kingfisher	*Alcedo atthis*	385	7	69	12
Dipper	*Cinclus cinclus*			1	2
Kittiwake	*Rissa tridactyla*	68	6	11	165