Northern Ireland Seabird Report 2022

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NI Seabird Steering Group

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This report is the published outcome of the work of the Northern Ireland Seabird Network – a network of volunteers, researchers and organisations – coordinated by the BTO Seabird Coordinator, and funded by NIEA.

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Contents

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Editorial

Katherine Booth Jones

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GUILLEMOT FLEDGLING / KEVIN KIRKHAM

This is the 10th edition of the *Northern Ireland Seabird Report*, covering 2022, and is the published outcome of the work of the Northern Ireland Seabird Network of volunteers, overseen by the British Trust for Ornithology (BTO) on behalf of the Northern Ireland Environment Agency (NIEA). At the core of the Seabird Network in Northern Ireland are our surveyors. Some work for government bodies such as NIEA, and others on behalf of Non-Government Organisations (NGOs) such as Royal Society for the Protection of Birds (RSPB), Ulster Wildlife and the National Trust. All are important contributors through the provision of data for 2022 and previous years, and provide advice and guidance from their expert staff. I am grateful for their co-operation and assistance. Many other surveyors are volunteers who give their time freely. The amount and quality of work undertaken by volunteers in Northern Ireland is exemplary, and we are fortunate that many enthusiastic and talented people are part of the Northern Ireland Seabird Network. I would like to thank everyone who has contributed to this report. Huge thanks also go to NIEA for their continued financial support for both the Seabird Coordinator role and for the production of this annual report.

While we had fervently hoped that after two years' worth of disruption due to the COVID-19 pandemic we would have a more 'normal' year for monitoring, it was the turn of our seabirds to suffer, with a deadly wave of Highly Pathogenic Avian Influenza (HPAI). In response to this, access to seabird colonies was greatly reduced from late June. Thankfully in terms of both seabird health and welfare in Northern Ireland, and from a monitoring perspective, HPAI appeared to arrive fairly late in the breeding season compared to colonies affected elsewhere in the UK. While this year was far from a 'normal' year, most monitoring was conducted as usual. You can read more about the impacts of HPAI in Northern Ireland on page 66 of this report.

It is important that this report represents a summary of current species knowledge, and that reference to other, earlier, reports is not necessary. In this we are taking a similar stance to the past Seabird Monitoring Programme (SMP) reports (**https://jncc.gov.uk/our-work/smp-report-1986-2019**). However, there has been some change this year to the structure of the SMP, with BTO taking over the national coordination of the scheme, and the programme now jointly funded by BTO and the Joint Nature Conservation Committee (JNCC), in association with RSPB. Future SMP reports will be produced by BTO. As in previous years, the report contains submitted articles that provide further detail on seabird-related topics and highlight some of the exciting research being undertaken in Northern Ireland. I am very grateful to the authors for giving their time to produce these articles.

Naturally this summary does not report all data, but all records collected are of real value in understanding Northern Ireland's seabirds. A report such as this is only as robust as the data that we can collect, so if you have additional seabird population data, either recent or historic, then please submit them online to the SMP database (**www.bto.org/smp**) or discuss this with the Northern Ireland Seabird Coordinator (myself, **Katherine.boothjones@bto.org**) or the SMP Organiser, Sarah Harris (**smp@bto.org**). Although the national census period has closed, I would encourage volunteers to continue to monitor their seabirds, as long-term, annual data collection is exceedingly valuable in tracing the health of our marine ecosystems. In particular, breeding success and survival data are rare in Northern Ireland, and I would love to hear from anyone interested in contributing to productivity monitoring or seabird ringing and survival monitoring (Retrapping Adults for Survival, RAS: **https://www.bto.org/our-science/projects/ringing/surveys/ras**).

I hope you enjoy the 2022 report!

Seabird monitoring overview

PUFFIN, LIZ CUTTING / BTO

Seabird colony censuses in the UK and Ireland

There have been four national seabird censuses covering the UK and Ireland. The first, Operation Seafarer, was conducted in 1969 and 1970 by the then recently formed The Seabird Group. More than 1,000 surveyors took part. The results were summarised in Cramp *et al.* (1974) *The Seabirds of Britain and Ireland*. Operation Seafarer was a major achievement and provided the first comprehensive and detailed account of the abundance and distribution of breeding seabirds in the UK and Ireland. However, Operation Seafarer also highlighted major problems in accurately counting some species, namely Storm Petrels *Hydrobates pelagicus*, Leach's Petrels *Oceanodroma leucorhoa*, Manx Shearwaters *Puffinus puffinus*, Razorbills *Alca torda*, Guillemots *Uria aalge*, Black Guillemots *Cepphus grylle* and Puffins *Fratercula arctica*.

The second census, known as the Seabird Colony Register (SCR), was instigated by the then Nature Conservancy Council and The Seabird Group. Most fieldwork was carried out from 1985 to 1988. The results were published in Lloyd *et al.* (1991) *The Status of Seabirds in Britain and Ireland*. The SCR provided the first assessment of nationwide trends through comparison with results from Operation Seafarer. Recently developed survey techniques provided more reliable baseline estimates for Guillemot, Razorbill and Black Guillemot and served as the foundation for future monitoring of seabird populations. Crucially it also allowed the national importance of individual colonies to be compared, and for sites to be designated as Special Protection Areas (SPAs) under the EC 'Birds Directive'. A legacy of the Seabird Colony Register (SCR) was the establishment of the Seabird Monitoring Programme (SMP, see below).

The third national census was Seabird 2000. It was co-ordinated by the Joint Nature Conservation Committee (JNCC) in partnership with other organisations: Scottish Natural Heritage (SNH), Countryside Council for Wales (CCW), Natural England (NE), NIEA, RSPB, The Seabird Group, Shetland Oil Terminal Environmental Advisory Group (SOTEAG), BirdWatch Ireland, and National Parks and Wildlife Service (Dept. of Environment, Heritage and Local Government, Republic of Ireland). Fieldwork was carried out from 1998 to 2002. Seabird 2000 provided population information on the 24 species of seabird which regularly breed in the UK and Ireland, estimating that over eight million seabirds breed in Britain and Ireland each year. Coverage was as comprehensive as possible and included, for the first time, counts of inland colonies. The updated population estimates allowed the identification of new (and the continued monitoring of existing) SPAs, and provided updated national trends. Seabird 2000 used recently developed playback techniques for the first time, providing reliable baseline estimates for petrel and shearwater populations. The results were published in Mitchell *et al.* (2004) *Seabird Populations of Britain and Ireland* and demonstrated that the seabird assemblage that breeds here is of extraordinary international importance.

The fourth national census, 'Seabirds Count' (**https://jncc.gov.uk/our-work/breeding-seabird-national-censuses**), was developed by the SMP Partnership and was coordinated by JNCC. Data collection for the census was undertaken between 2015 and 2021, after delays caused by the COVID-19 pandemic required an extension from 2020. On top of the professional coverage required to survey challenging colonies, the continued support of the volunteer Northern Ireland Seabird Network who contribute to this report annually has played a vital role in filling monitoring gaps for the recent census. The results of the Seabirds Count census are due to be published in 2023.

The Seabird Monitoring Programme (SMP)

Since 1986, seabird populations in the UK and Ireland have been monitored through the SMP (**www.bto.org/smp**) coordinated on behalf of 19 partnership organisations by JNCC until July 2022. In July 2022, a new agreement was signed, and a new Partnership formed: the Seabird Monitoring Programme is now jointly funded by BTO and JNCC, in association with RSPB. An Advisory Group of 24 organisations (those who formed the previous Partnership, including the new Partners and organisations undertaking integrated population monitoring at four 'Key Sites') was also formed to help steer the programme going forward.

Annual data on breeding abundance and breeding success of seabirds are collected from a large network of sites, both regionally and nationally, to enable species' conservation status to be assessed. To examine trends at individual colonies, at country level and across the whole UK, it is essential that individual sites can be monitored consistently for many years.

Data on breeding abundance – the number of breeding pairs or individuals – provide a medium- to long-term measure of how populations are faring. Data on breeding success/productivity – the number of chicks fledged per breeding pair – are regarded as a short-term or more immediate measure of changes in the wider environment (Parsons *et al.* 2008).

Studies at the four SMP Key Sites (Isle of May, Canna, Fair Isle and Skomer) provide extra information on adult survival, diet and phenology for selected species, which in conjunction with data on breeding success are used to help to diagnose the changes in abundance. Additional data on survival rates at other sites are collected through the BTO's Retrapping Adults for Survival (RAS) scheme (Horswill *et al.* 2015), although there are only two current RAS sites for seabirds in Northern Ireland.

The SMP generates annual indices of abundance and breeding success from these data, which were reported on the JNCC website up to 2019 (JNCC 2021: **https://jncc.gov.uk/our-work/smp-report-1986-2019**) and now are published on the BTO website. Where possible, trends are given at the scale of the UK- or country-level, but where coverage is only possible at individual sites, the indices are shown at the site level. The SMP is a vital programme for monitoring seabird population trends between the full national censuses.

Why monitor seabirds?

The SMP enables its partners to monitor the health of the marine environment and inform seabird conservation issues. Monitoring seabirds is important for several reasons:

- seabirds are an important component of marine biodiversity in the UK.
- seabirds are top predators and a useful indicator of the state of marine ecosystems.
- human activities impact upon seabirds, both positively and negatively, and these effects should be monitored.
- the UK is internationally important for seabirds.
- seabirds are protected by law and the UK has obligations to monitor and protect populations.
- monitoring provides data which underpin targeted conservation policy development and action.

The Northern Ireland Seabird Coordinator role

In 2013, NIEA initiated funding for a 'Northern Ireland Seabird Coordinator' post at BTO. The main aim of the post is to facilitate an increase in annual seabird monitoring across Northern Ireland. Critical to this is the active support and engagement of volunteer seabird monitors (the Northern Ireland Seabird Network), who collect much of the seabird data in Northern Ireland. The Coordinator works closely with SMP partners to ensure that all monitoring data collected by volunteers feed into the SMP online database (**https://app.bto.org/seabirds/public/index.jsp**), which has included the creation of a definitive register of Northern Ireland sites (see below). The role also includes the compilation of an annual report on the state of seabird populations (this report), with input from the Northern Ireland Seabird Steering Group, consisting of independent experts, the RSPB, the National Trust, Ulster Wildlife, the Marine and Fisheries Division (DAERA) and NIEA (DAERA). The Steering Group also advises on the programme of activities for the Coordinator and the evolution of the Northern Ireland Seabird Network. Additionally, the Coordinator acts as an advisor and representative of the Northern Ireland Seabird Steering Group and volunteer network on the Northern Ireland Seabird Conservation Strategy Steering Group, led by the Marine and Fisheries Division. The Northern Ireland Seabird Coordinator role is now included in the duties of BTO's Senior Research Ecologist for Northern Ireland. This role is unique and provides an exemplar for better support and co-ordination of annual monitoring of seabirds in Britain and Ireland.

Strategies for seabird monitoring and conservation in Northern Ireland

In 2013, a strategy for seabird monitoring in Northern Ireland was developed (Northern Ireland Seabird Data Collection Strategy 2014–19, *unpublished report to NIEA*). The strategy provided the context and set minimum requirements for the annual monitoring of breeding seabirds in Northern Ireland to facilitate effective management of this natural resource. It focused on the monitoring of populations and productivity in Northern Ireland while also facilitating further detailed studies of those populations. The main objectives were:

- to identify priorities for seabird monitoring in Northern Ireland.
- to identify priorities for seabird research in Northern Ireland.
- to gather data which assist NIEA and conservation NGOs in managing protected seabird species and habitats.
- to increase the number of seabird breeding sites monitored annually.
- to increase the number of people involved in seabird monitoring in Northern Ireland.

The objectives of this strategy continue to be kept under review by the NI Seabird Steering Group, and new focus will be added through the development of a Northern Ireland Seabird Conservation Strategy (NISCS) in 2022/2023. The NISCS is being developed by DAERA, with the advice and feedback from an Advisory Group, in tandem with conservation strategies in each of the Devolved Administrations. The NISCS will review and report on the current status of seabird populations and identify and assess their sensitivity to threats and pressures, informing management recommendations to maintain and improve conservation status. Following a public consultation, the Strategy will be published in 2023.

The objectives of the NISCS are to:

- collate existing evidence from all seabird monitoring efforts in Northern Ireland.
- review the current data and distributions of seabirds in the Northern Ireland marine area and at their breeding sites.
- understand the impact of threats and pressures on seabirds at sea and at their breeding habitats, through vulnerability assessments to inform future management and decision making.
- ensure effective protection and management of the marine ecosystem is developed around the Northern Irish coast to aid the recovery of seabirds and wider natural interest, through targeted recommendations and action plans.
- identify the knowledge gaps to enhance the evidence base and data availability of seabird distribution and populations which will target future research and monitoring goals.
- bring the Department, stakeholders and public together to implement the recommendations and actions identified, and to raise awareness of the importance of seabirds in Northern Ireland.
- conduct a review of the Strategy every six years, with the ability to change species scope to reflect environmental change and species where appropriate.

The Northern Ireland sites register

During 2013 a full register of all known, possible or potential seabird nesting sites, consistent with the SMP site register, was created by the Northern Ireland Seabird Coordinator, and which provided definitive spatial boundaries for each site. This means that every part of the Northern Ireland coastline now has a recording section for data entry in the SMP online database. All known inland sites are also listed. Sites are grouped by general area into 'Master Sites'. Master Sites usually can contain a number of different sub-sites, for example along stretch of coastline or in a large lough, or they might contain just one site, for example a small, isolated lough. Due to legacy issues from historical record keeping and the way data are held in the SMP online database, a separate site register is maintained for Black Guillemot.

Breeding seabirds in Northern Ireland in 2022

Katherine Booth Jones

BTO NI Senior Research Ecologist and Seabird Coordinator

HERRING GULL / EDMUND FELLOWES

The following species accounts summarise the known status of each breeding seabird species in Northern Ireland (see Table 1). The accounts also provide a summary of population trends at the main breeding sites, where data exist. These data were collected by many volunteers and site wardens across Northern Ireland and a list of those contributors is given at the end of this report. Many other people have contributed records from the 1960s onwards, when concerted monitoring began for some species. Without that recording we would not be able to generate these population graphs and tables.

Table 1: Seabird species breeding in Northern Ireland

Species	NI Priority[1]	BoCCI4 Status[2]	UK BoCC5[3]	IUCN Red List[4] (Europe)
Fulmar	N	AMBER	AMBER	Vulnerable
Manx Shearwater	N	AMBER	AMBER	Least Concern
Storm Petrel	N*	AMBER	AMBER	Least Concern
Cormorant	N*	AMBER	GREEN	Least Concern
Shag	N*	AMBER	RED	Least Concern
Great Skua	N*	AMBER	AMBER	Least Concern
Kittiwake	N	RED	RED	Vulnerable
Black-headed Gull	Y	AMBER	AMBER	Least Concern
Mediterranean Gull	N*	AMBER	AMBER	Least Concern
Common Gull	N	AMBER	AMBER	Least Concern
Lesser Black-backed Gull	N	AMBER	AMBER	Least Concern
Herring Gull	Y	AMBER	RED	Least Concern
Great Black-backed Gull	N	GREEN	AMBER	Least Concern
Little Tern**	Y	AMBER	AMBER	Least Concern
Sandwich Tern	N	AMBER	AMBER	Least Concern
Common Tern	N	AMBER	AMBER	Least Concern
Roseate Tern	Y	AMBER	RED	Least Concern
Arctic Tern	N	AMBER	AMBER	Least Concern
Guillemot	N	AMBER	AMBER	Least Concern
Razorbill	N*	RED	AMBER	Least Concern
Black Guillemot	N*	AMBER	AMBER	Least Concern
Puffin	N*	RED	RED	Endangered

[1] Northern Ireland Priority species are those identified during the preparation of the Northern Ireland Biodiversity Strategy (2002) and subsequently, using criteria set out by stakeholders (http://www.habitas.org.uk/priority). An updated list was published by DAERA on 31 January 2023 (https://www.daera-ni.gov.uk/publications/list-northern-ireland-priority-species-2023) but the list used here is contemporary to the report. [2] Birds of Conservation Concern in Ireland 4 (Gilbert *et al.* 2021). [3] UK Birds of Conservation Concern 5 (Stanbury *et al.* 2021). Due to the delay in completion of Seabirds Count census surveys – a consequence of the COVID-19 pandemic, seabird status has not been revised for the BoCC5. [4] International Union for Conservation of Nature's Red List of Threatened Species (IUCN 2023). * Added to the 2023 Northern Ireland Priority Species List. ** Not currently breeding, historical records only.

In Northern Ireland, the Birds of Conservation Concern Ireland (BoCCI) list is used for flagging species conservation issues (Gilbert *et al.* 2021). Following the 2021 reassessment, three species were moved from the Amber List to the Red List in Ireland due to their conservation importance at the European level: Kittiwake (Vulnerable, IUCN), Puffin (Endangered, IUCN) and Razorbill (Near Threatened, IUCN), although since this assessment Razorbill has been reclassed by IUCN as Least Concern (IUCN 2023). Since the last assessment in 2013 (Colhoun & Cummins 2013), declines were less severe for Herring Gull and Black-headed Gull populations, resulting in these moving from the Red List to the Amber List, and Great Black-backed Gulls moved from the Amber List to the Green List. The UK equivalent (Birds of Conservation Concern, BoCC5) was also updated in 2021 but, because the new seabird census results were not available, assessments of the status of seabird species were not updated (Stanbury *et al.* 2021).

There are some notable differences between the All-Ireland BoCCI list and BoCC5 (Stanbury *et al.* 2021). In particular, Shag, Herring Gull and Roseate Tern on the Red List in the UK, but are on the Amber List in Ireland. Although data were lacking from important colonies at Rathlin Island and The Maidens in recent years, Shags appeared to be stable in Northern Ireland; likewise, while Kittiwakes remained relatively stable or declined at a lower rate than the rest of the UK (Leonard 2016a), their increased global conservation status has resulted in their move to the Red List in the BoCCI4 (Gilbert *et al.* 2021). The Roseate Tern is not Red-listed on the island of Ireland as it is in the UK, since it supports the largest European colony for the species at Rockabill in Dublin (Leonard & Wolsey 2016). Despite this, the Roseate Tern remains a precarious breeding species in Northern Ireland. Cormorants are Amber-listed in Ireland compared to being Green-listed in the UK due to the localised breeding criteria (more than 50% of the breeding population was found at 10 or fewer sites), and Razorbills are Red-listed in Ireland but Amber-listed in the UK; again, this is due to their increased global conservation status (BirdLife International 2015) at the time this assessment was made.

Seabird surveys of abundance and breeding success in the UK and Ireland are undertaken using standard survey guidelines for each species (Walsh *et al.* 1995). Tables 2 and 3 briefly outline the survey units and methods used for estimating the numbers of each species under consideration in Northern Ireland.

Table 2: Units for surveys of seabird numbers/abundance.

Unit	Abbreviation	Description
Apparently Occupied Nest	AON	An active nest occupied by a bird, pair of birds, or with eggs or chicks present.
Apparently Occupied Territory	AOT	When nests cannot be discerned (e.g. for Great Skua), the presence of a nest may be inferred at the time of year when nests are likely to be complete or eggs are newly hatched by the presence of an incubating adult, or adult displaying territorial behaviour.
Apparently Occupied Site	AOS	An active site occupied by a bird, pair of birds, or with eggs or chicks present. Used for species without obvious nests such as Fulmar.
Apparently Occupied Burrow	AOB	An apparently active and occupied burrow which may have a nest.
Individuals	IND	Individual birds.

Table 3: For consistency and for convenience to volunteers in Northern Ireland we recommend following the methods and the timings outlined below for recording seabird abundance. The methods listed here are derived from Walsh *et al.* (1995) where more detailed descriptions and comparisons of all survey methods can also be found, in addition to methods for measuring breeding success. For an explanation of units, see Table 2.

Species	Unit	Notes
Fulmar	AOS	Count between 09.00 and 17.30, late May to early July. Apparently Occupied Sites are those ledges suitable for nesting with a bird present (Population–monitoring method 1).
Manx Shearwater	AOB	Late May to early June. Survey using tape playback between 09.00 and 17.00 (Population–monitoring method 2).
Cormorant	AON	Local knowledge of timing of breeding useful, but generally early to mid-June (Population–monitoring method 1).
Shag	AON	Local knowledge of timing of breeding useful, but generally late May or multiple counts between May and June (Walsh *et al.* 1995).
Great Skua	AOT	Count period late May to mid June.
Kittiwake	AON	Count late May to mid June. Only count completed nests with at least one adult attending.
All gull species (excluding Kittiwake)	AON IND	Count late May to mid June. Counts of adults on nests, or transects to count nests. Alternatively, flush counts of individual adults (Population–monitoring method 1, 3, or 5).
All tern species	AON IND	Count period between mid May and late June (especially late May and early June). Counts of adults on nests or transects to count nests. Alternatively, flush counts of individual adults (Population–monitoring method 1, 2 or 3).
Guillemot	IND	Count between 08.00 and 16.00, made in the first three weeks of June, with ~5 repeats if possible. Birds on tidal rocks or sea excluded.
Razorbill	IND	Count between 08.00 and 16.00, made in the first three weeks of June, with ~5 repeats if possible. Birds on tidal rocks or sea excluded.
Black Guillemot	IND	Count any birds seen within c. 300 m of the shore and any on land, between 05.00 and 09.00, during the first three weeks in April.
Puffin	IND	Ideally, AOS/AOB should be counted, following methods described in Walsh *et al.* 1995. For small colonies, as may be present in Northern Ireland (outside of Rathlin Island), count individuals above ground, flying over the colony and birds within 200 m of the shore in April (Census-method 3). Evening or early morning visits will produce highest counts.
Storm Petrel	AOB	Storm Petrels are not currently known to breed in Northern Ireland, therefore no recommendations are specifically made here.

Species accounts are structured as follows:

Overview – conservation status, a brief description of the species characteristics, population size estimates from censuses and SMP trends for abundance and breeding success for the UK as a whole and for Northern Ireland (JNCC 2021: **https://jncc.gov.uk/our-work/smp-report-1986-2019**).

Abundance – a summary of the latest data available on breeding numbers (abundance) in Northern Ireland, with historical trends where data are available. In most cases, graphs show population trends, and, unless otherwise stated, gaps in graphs mean no count was carried out during that year. Where data are available for all years, a smoothed trend curve is fitted through the data points using a local polynomial regression fitting method ('loess') in the R package 'ggplot2', version 3.4.0 (R version 4.2.2). The curve is presented with a standard error 95% confidence interval at around the smoothed curve. For abundance data which represent the entire population of Northern Ireland (or near-to), for example, for Mediterranean Gulls and tern species, cumulative plots are given.

Breeding success – a summary of the latest data available on breeding success in Northern Ireland. For species with sufficient data for visualisation, productivity is plotted per year across all sites where productivity was measured. In these plots, a trend curve is fitted through the data points using the methods described for breeding numbers above. However, it should be noted that these trends are based on small sample sizes and are not weighted for sample size per site and are therefore best used as a quick visual representation only and should be interpreted with caution.

A table detailing specific counts of breeding numbers at defined SMP Master Sites in Northern Ireland between 2015 and 2022 can be found in Table 6 in the Appendix on page 84. Additional data collected on seabirds and other bird species at the UK-level, such as range change, seasonality, movement and biometrics and can be found on the BTO BirdFacts pages: **www.bto.org/birdfacts**.

Priority gaps in 2022 and onwards

There will always be sites that require professional effort or additional equipment to fully survey. Each year the Northern Ireland Seabird Steering Group meets to review coverage and the table below outlines sites and species of particular priority.

Table 4: Key seabird monitoring gaps identified by the Northern Ireland Seabird Steering Group in 2022.

Site	Difficulties and gaps	Planned coverage
Mew Island and Big Copeland, the Copeland Islands, Co. Down	Access requires landowner permissions and a boat. Big Copeland is a large island and requires experienced survey effort. The important gull and tern colonies on Mew and Big Copeland have not been surveyed in recent times.	No
The Gobbins, Co. Antrim	Boat-based surveys are essential and previously good annual coverage was achieved, providing both abundance and breeding success data.	No
The Skerries, Co. Antrim	Access is difficult, requires a boat and permission from the owner via NIEA.	Coverage achieved in 2021, and by drone in 2022 for Cormorant, but the islands would benefit from regular monitoring. This site may also host an unmonitored population of Black Guillemot.
Sheep Island, Co. Antrim	Access to the island itself is dangerous and surveying requires a boat. Views of breeding seabirds are limited from boat-based surveys. The full island is best surveyed using a drone.	Coverage achieved by drone in 2021 and by drone in 2022 for Cormorant but the island would benefit from regular monitoring and more comprehensive coverage.
North and South Rock, Outer Ards, Co. Down	Small islands requiring a boat to observe nesting Cormorants and gulls.	No
The Maidens	Access by boat is difficult as the islands are surrounded by strong tides and there is no safe landing area. This site is important for Shag in Northern Ireland.	Good annual coverage for Black Guillemot, but no coverage for Shag.
Strangford Lough, Co. Down.	The complex system of islands in Strangford Lough may hold breeding Black Guillemots, however surveying these requires a boat.	No
Rathlin Island, The Skerries and Sheep Island	While mostly considered to be absent as breeding seabirds in Northern Ireland, European Storm Petrels are difficult to survey and may be present on islands such as Rathlin Island, The Skerries and Sheep Island. Playback equipment and access to a boat are necessary to survey Storm Petrels.	No

Abundance data are the most commonly collected data in Northern Ireland and provide the most important measure of how our seabirds are faring through time. However, monitoring breeding success and adult survival provides the context by which potential environmental drivers, such as climate change, prey availability and predation, can be linked to population changes. In Northern Ireland, however, these data are sparse or non-existent for many species. There are great examples of volunteer-led breeding success monitoring currently underway in Northern Ireland: for example, at Portrush and Maggy's Leap for Kittiwake and for Black Guillemot at Annalong. RSPB, National Trust and Ulster Wildlife provide invaluable breeding success information for the islands they monitor, particularly for terns.

Despite these efforts, breeding success data have nevertheless not been collected recently for many other species. Now that the Seabirds Count census period is complete, the Northern Ireland Seabird Coordinator aims to increase support for volunteers wishing to collect these vital data. Monitoring adult survival is achieved through general metal ringing and colour-ringing studies (such as Retrapping Adults for Survival, RAS: **https://www.bto.org/our-science/projects/ringing/surveys/ras**), activities that are also rare in Northern Ireland. BTO is currently developing training support to boost seabird ringing around the UK through the Seabird Appeal (**https://www.bto.org/how-you-can-help/help-fund-our-work/appeals/our-lost-seabirds**), but non-ringers can also contribute by reporting sightings of ringed birds (**https://app.bto.org/euring/lang/pages/rings.jsp**).

Get involved!

If you are interested in seabird monitoring in Northern Ireland, please get in touch with the Seabird Coordinator (**katherine.boothjones@bto.org**) to be added to the Northern Ireland Seabird Network. You can also find some simple introductions to monitoring common species in Northern Ireland in the following Google Drive online: **https://bit.ly/NI_Seabird_Guidance**, which are also available on request from the Seabird Coordinator.

You can see an interactive, zoomable version of the coverage maps online by following this link: **https://bit.ly/NI_Seabird_Sites**. The online maps are coloured by coverage and split between sites for 'all-seabirds' and for Black Guillemots, reflecting the division of the SMP database by these categories. If you click on a site of interest it will be highlighted, showing the extent of the site, its name and information on whether it is currently assigned to a volunteer. Please explore these online maps if you are interested in contributing seabird monitoring data in Northern Ireland. If you would like help viewing these maps or would like to discuss coverage of any of the sites, please email the Seabird Coordinator.

PUFFIN, SARAH KELMAN / BTO

Species accounts

Fulmar

Fulmarus glacialis

Conservation status: Amber-listed in the BoCCI4 (2020–26), Amber-listed in BoCC5 (2021), EC Birds Directive – migratory species, Vulnerable – IUCN Red List (Europe).

GEOFF CAMPBELL

Overview

Synopsis: Fulmars are tube-nosed seabirds around the size of a small gull that nest in loose cliff-based colonies. They can use relatively small cliff faces, sometimes several miles inland. They are non-migratory and can be seen all year round. The name Fulmar means 'foul gull'.

UK population size, abundance and breeding success trends: Fulmars are very common in northern Britain. The UK Fulmar population increased between the 1969–70 and 1985–88 censuses (from ~291,000 to 517,000 pairs) but remained stable between 1985–88 and 1998–2002 when 501,609 pairs were recorded. The latest UK breeding population estimate is 350,000 (195,000–680,000 (Mitchell *et al.* 2004; Woodward *et al.* 2020). An increase in the use of commercial discards has been cited as one of the reasons for a massive increase in breeding range and population size across the North Atlantic in the 20th century (Mitchell *et al.* 2004; Phillips *et al.* 1999), and that changes in legislation around fisheries discards may be partly responsible for Fulmar declines (Bicknell *et al.* 2013). The SMP Report highlights that the population index for 2019 was 37% below the 1986 baseline (JNCC 2021). Fulmar has been upgraded from Green-listed to Amber-listed in the latest Birds of Conservation Concern Ireland due to an increase in their priority status across Europe (Gilbert *et al.* 2021).

At the UK level, the annual productivity index for Fulmar has been variable but generally increasing since 2006 and in 2019 was 0.39 chicks/AOS (JNCC 2021), but the overall fall in productivity observed since 1986 may have contributed to their population decline.

Northern Ireland population size, abundance and breeding success trends: In Northern Ireland, the Fulmar is a widespread breeding species, with the most important site being at Rathlin Island. Other notable sites are Downhill and Binevenagh on the north coast, although numbers here have declined, and The Gobbins and Muck Island on the east coast. Small numbers are scattered around the coast where suitable cliff habitat occurs. Between the 1985–88 and 1998–2002 censuses Fulmar numbers increased in Northern Ireland from 3,540 to 5,992 breeding pairs (Mitchell *et al.* 2004, JNCC 2021). Since Seabird 2000, annual monitoring indicates that numbers in Northern Ireland have generally decreased, following the trend for the UK as a whole (JNCC 2021).

The collection of productivity data in Northern Ireland has been limited; therefore productivity estimates cannot be modelled at the regional-level (JNCC 2021).

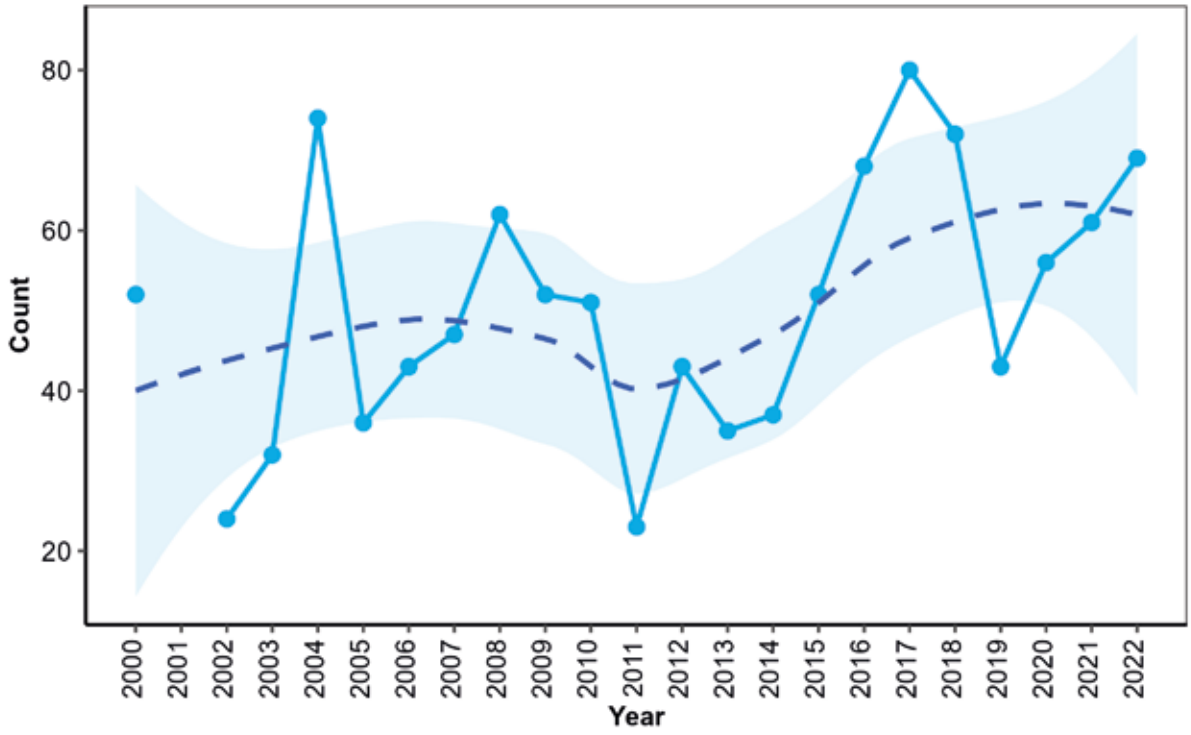
Abundance in 2021

Fulmars continue to be at a low ebb in Northern Ireland (Table 6, Appendix), with numbers at most sites monitored this year mostly stable or declining slightly. In Co. Londonderry, Fulmars appear to be vanishing with only 44 AOS recorded at Downhill in 2022, a decline of 66% on last year's count. Numbers of breeding Fulmars at Downhill during the census period (2015–2021) have fluctuated (mean count 101 AOS, 95% CI: 75–127 AOS), but the peak count in this period (135 AOS in 2016) is well below the Seabird 2000 count of 995 AOS (86% decline). The particular cause of the losses of Fulmars in Downhill and neighbouring Binevenagh (seven AOS in 2022, down from a high of 217 in 2000) is unclear; given the particular steep declines here compared to other sites, it may be that local conditions are a factor.

Elsewhere, good coverage was achieved, and there were some small between-year increases at some sites. In particular, Muck Island had its best year for Fulmars since 2018 (Figure 1), with a small increase from 61 AOS in 2021 to 69 AOS in 2022. Although this population is smaller than that of the nearby site of The Gobbins, Fulmar numbers here have been relatively stable since the 1998–2002 census. The Gobbins has not been surveyed since 2019, but between 2015–19 it hosted 268 AOS (95% CI:198–339). Fulmars elsewhere along the East Antrim coastline remain scattered and in small but relatively stable numbers, with a total of 32 AOS recorded here in total in 2022 (Table 6, Appendix).

A full census of Rathlin Island, which hosts the main concentration of Fulmars in Northern Ireland, and of the north Antrim coastline between Runkerry and Murlough occurred as part of the MarPAMM project in 2021 (Booth Jones *et al.* 2022). On Rathlin, Fulmar numbers had declined since the 1998–2002 census by 38% to 1,038 AOS, while between Runkerry and Murlough, numbers declined by 25% to 1,152 AOS.

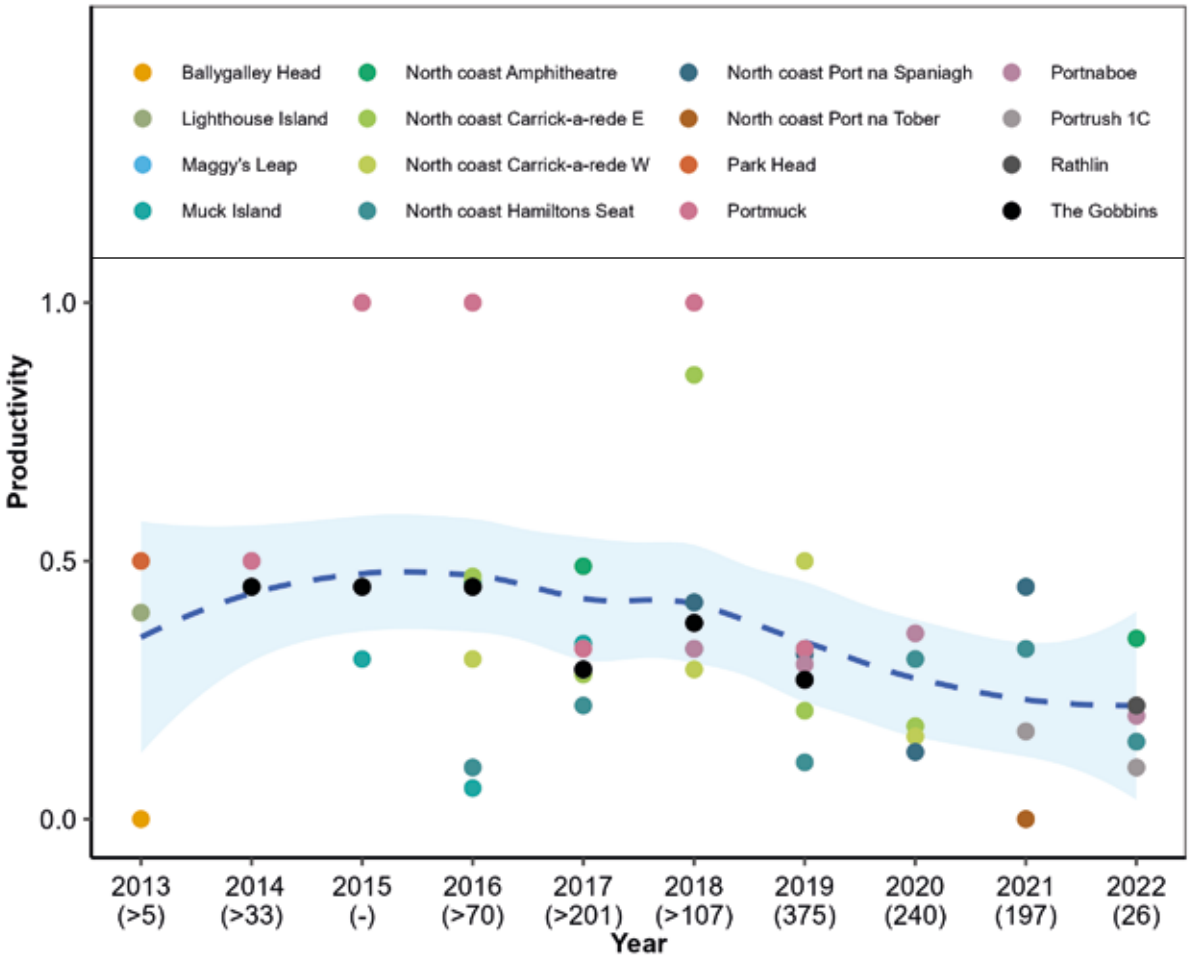
Figure 1: Fulmar counts (AOS) at Muck Island, 2000-2022. No data were available for 2001. The dashed line represents the Locally Weighted Least Squares Regression trend in Fulmar numbers over time. The shaded region represents the 95% confidence interval around the trend.



Breeding success in 2021

Over the past 10 years, Fulmar productivity has been highly variable between Northern Irish colonies and breeding seasons (Figure 2), although has generally remained below 0.50 chicks per pair. In 2022, Fulmar productivity was monitored at five sites along the north Co. Antrim coast. Figure 2 shows an overall decline in productivity among Fulmar colonies in Northern Ireland since 2013, with an average productivity in 2022 of 0.20 chicks per pair. The site with the highest productivity this year was the Amphitheatre at the Giant's Causeway, with 0.35 chicks per pair (Cliff Henry). The lack of data from outside north Antrim in 2022 limits the inference that can be made for productivity at the country-level.

Figure 2: Productivity (chicks/AOS) for Fulmar 2013–22 across 16 sites in Northern Ireland. The dashed line represents the Locally Weighted Least Squares Regression trend in productivity over time. The shaded region represents the 95% confidence interval around the trend. Sites measured for Fulmar productivity between 2013 and 2022 include: Rathlin Island, Ballygalley Head, Lighthouse Island, Maggy's Leap, Muck Island, Portmuck, The Gobbins, sections of the North Coast master site, Park Head and Portnaboe. The total number of AOS monitored per year is included in brackets under the year, with unknown numbers denoted by a hyphen (-).



Manx Shearwater

Puffinus puffinus

Conservation status: Amber-listed in the BoCCI4 (2020–26), Amber-listed in BoCC5 (2021), EC Birds Directive – migratory species, Least Concern – IUCN Red List (Europe).

LIZ CUTTING / BTO

Overview

Synopsis: Manx Shearwaters are burrow-nesting, tube-nosed seabirds. They are highly pelagic, spending most of the year at sea and only coming ashore under the cover of darkness to avoid avian predators. They are also the longest-living seabird recorded in the UK, with one recorded as more than 50 years old (BTO 2023).

UK population size, abundance and breeding success trends: Most of the world's population of Manx Shearwaters breeds in Britain and Ireland (Hamer & Hill 1997; Mitchell *et al.* 2004). At the time of the last census, an estimated 299,678 AOS were counted in the UK (Mitchell *et al.* 2004; Woodward *et al.* 2020). However, the secretive, burrow nesting lifestyle of Manx Shearwaters makes them a difficult species to survey, and the breeding population of Manx Shearwater was only comprehensively surveyed for the first time during Seabird 2000 (1998–2002, Mitchell *et al.* 2004). Annual changes in breeding abundance are not reported by the SMP, while changes in survey methods over time have meant that population trends from the censuses across the UK are not reliable. The largest colony in the world is on the island of Skomer in Wales. Recent surveys of strongholds in Wales and in Scotland suggest that the population of these islands may have increased by 50% to around 600,000 AOs since the last 1988–2002 census (JNCC 2021).

Due to the difficulty in surveying Manx Shearwater burrows, few sites in the UK are monitored for productivity. Among these, average Manx Shearwater productivity was 0.65 chicks per pair per year between 1986 and 2019, and there is little year-to-year variation (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: The only confirmed extant colony in Northern Ireland is on the Copeland Islands, where there are birds on Lighthouse Island and Big Copeland. The Copeland Islands were surveyed in 2021, but figures are not yet available. During the previous survey in 2007 (Stewart & Leonard 2007), there were approximately 3,444 AOB (95% CI: 2,620–4,269) on Lighthouse Island and 1,406 AOB (95% CI: 612–1,432) on Big Copeland. There was an apparent 5.3% increase on the previous survey in 2000, although the former survey result was within the confidence limits of the 2007 population estimate. The presence of Rabbits *Oryctolagus cuniculus* on Mew for the last 15 years may have facilitated colonisation by breeding Manx Shearwaters due to the creation of suitable nesting burrows (Rhodes 2017).

Rathlin Island formerly held a colony of unknown size (Brooke 1990) but the species has not been confirmed breeding for many years (Liam McFaul, RSPB, pers. comm.) and surveys for Seabird 2000 (1998–2002) did not detect any birds. Deane (1954) estimated 150 AOB on Rathlin Island but the Operation Seafarer (1969–70) figure was 1,000–10,000 AOB (Mitchell *et al.* 2004). The inaccessibility of the cliffs and the cryptic nature of the species make these estimates unreliable. All that is certain is that a huge decline has occurred on the island.

Breeding success was monitored on Lighthouse Island by Copeland Bird Observatory between 2007 and 2013, using study burrows. These consist of modified burrows with a concrete slab placed over the nesting chamber to allow easy access. In the seven years of monitoring, average breeding success on Copeland (0.74 chicks/AOB) was usually a little higher than at other sites in the UK (0.65 chicks/AOS, JNCC 2021), although extremely wet weather in 2007 resulted in a success rate of just 0.38 chicks per pair.

Abundance in 2022

There is no annual surveying of Manx Shearwaters in Northern Ireland but a census of the Copeland Islands was made as part of the MarPAMM project in 2021, with results still to be reported.

Breeding success in 2022

Breeding success data are not routinely collected for Manx Shearwater in Northern Ireland. In 2018, a sample of study burrows on Lighthouse Island was monitored by the Oxford Navigation Group (**https://www.oxnav.org**) with the support of the Copeland Bird Observatory. Of the 117 burrows checked, 39 contained eggs and were shallow enough to follow to the chick rearing phase. In August, 30 of these study burrows contained chicks. If it is assumed that chick presence in August is a good (if slightly inflated) indicator of the number of fledged young, the productivity of the sample of occupied nests in 2018 was 0.77 chicks per pair. Methods may not have been consistent with previous years monitoring; therefore, this estimated productivity has not been included in Table 5 for comparison.

Table 5: Manx Shearwater productivity at Copeland Bird Observatory.

Year	Nests sampled	Chicks hatched per pair	Chicks fledged per pair
2007	71	Not recorded	0.38
2008	67	0.70	0.67
2009	76	0.83	0.82
2010	65	0.88	0.88
2011	60	0.86	0.86
2012	50	0.78	0.76
2013	54	0.82	0.80

Storm Petrel

Hydrobates pelagicus

Conservation status: Amber-listed in the BoCCI4 (2020–26), Amber-listed in BoCC5 (2021), EC Birds Directive – listed in Annex 1 and as a migratory species, Least concern – IUCN Red List (Europe).

JOE PENDER

Overview

Synopsis: Storm Petrels are sparrow-sized tube-nosed seabirds. They are highly pelagic, only returning to land to breed. They eat mostly plankton and small fish on the surface of the sea without alighting, almost appearing to walk on water, pattering across the water's surface.

UK population size, abundance and breeding success trends: The UK breeding population of Storm Petrel was only comprehensively surveyed for the first time during Seabird 2000 (1998–2002) using a standard playback method (Mitchell *et al.* 2004; Ratcliffe *et al.* 1998), when ~25,700 pairs were estimated. Surveys for Storm Petrels are intensive and costly, and therefore rare; however, recent surveys of Scottish islands suggest an increase in population size since the 1998–2002 census (JNCC 2021). While new monitoring techniques, such as passive infra-red and endoscopes, are being tested for their usefulness in monitoring storm petrels, these methods are still costly in terms of fieldwork effort and equipment (Perkins *et al.* 2017). For similar reasons, there is a lack of annual data collected on productivity.

Northern Ireland population size, abundance and breeding success trends: The species has no known breeding sites in Northern Ireland. In their review of the birds of Ireland, Ussher and Warren (1900) stated that "two small islands off the north coast of Antrim" were reported to have populations of Storm Petrels. The only small islands which they could realistically have been referring to are Sheep Island, Antrim and one of The Skerries. A volunteer visit to The Skerries in 2021 reported that there were few areas of suitable nesting habitat available on the islands for Storm Petrels, and that the large gull population on Large Skerries, where Rabbit burrows could provide some nesting habitat, may deter Storm Petrels from breeding here. Deane (1954) reported up to a dozen pairs on Sheep Island, but the species is considered unlikely to be still there. It may be present on Rathlin Island but no surveys have yet been conducted. The nearest colony is on Sanda Island, Scotland which is just 37 km to the east.

Cormorant

Phalacrocorax carbo

Conservation status: Amber-listed in the BoCCI4 (2020–26), Green-listed in the BoCC5 (2021), EC Birds Directive – migratory species, Least Concern – IUCN Red List (Europe).

GEOFF CAMPBELL

Overview

Synopsis: The Cormorant is a widespread breeding species, often found in dense colonies. The characteristic open-winged posture they adopt after fishing is due to the need to dry their feathers, which are not waterproof.

UK population size, abundance and breeding success trends: The UK population estimate from the Seabird 2000 (1998–2002) census was 8,900 AON, an increase of 10% since the previous census (JNCC 2021). The UK breeding abundance index for Cormorants 1986–2019 indicates that the population increased between 1986 and 1995, and while it declined slightly after 2005, the 2019 index was 30% above the baseline (JNCC 2021). The latest UK winter population estimate is 64,500 (Frost *et al.* 2021; Woodward *et al.* 2020).

UK productivity remained fairly constant between 1991 and 2019, with nests fledging 1.84 chicks on average (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: The increase seen at the UK level between the 1985–88 and 1998–2002 censuses was in contrast to the trend in Northern Ireland, where Cormorant numbers dropped from 736 AON to 663 AON during the same period. There are no inland breeding colonies of the European subspecies (*Phalacrocorax carbo sinensis*) in Northern Ireland. Cormorants have historically principally bred at two sites – Sheep Island (north coast, Co. Antrim) and Bird Island (Strangford Lough). In 2010, the Sheep Island colony split with some birds moving to The Skerries. Smaller numbers are found at The Gobbins and Burial Island on the Outer Ards Peninsula, although the latter site is not monitored annually. The latest Northern Ireland winter population estimate is approximately 2,500 (Frost *et al.* 2019; Woodward *et al.* 2020).

The collection of productivity data in Northern Ireland has been limited; therefore productivity estimates cannot be modelled at the regional-level (JNCC 2021).

Abundance in 2022

Long-term annual data dating back to 1986 are available for Bird Island, Strangford Lough, where numbers increased erratically until 2005, to a peak of 490 AON (Figure 3). Since then, numbers have fallen but appeared to be increasing again in recent years. An unusually low count was recorded 2020, likely due to survey delays caused by COVID-19 restrictions, and therefore the counts of 370 AON in 2021 and 364 AON in 2022 are more comparable with counts of recent years.

Numbers of Cormorants on Sheep Island declined between 2005 and 2015, before stabilising in more recent years (Figure 4). A full census of Sheep Island was carried out using a drone as part of the MarPAMM project in 2021, finding 139 AON. This was the highest count since 2010 which may be in part due to the better coverage achieved using the vantage of the drone (Booth Jones, *et al.* 2022). However, a similar drone survey conducted by NIEA found 86 AON on Sheep Island in 2022, confirmed by a simultaneous scoped vantage-point count, demonstrating that breeding numbers can vary widely year-to-year. This may be due to the prolonged breeding season of Cormorants and a sensitivity to disturbance (Richard Donaghey, see article on page 71).

The Skerries have not been surveyed for as long as Sheep Island, and counts have varied substantially between years. It seems probable that the original population of Sheep Island is now spread between the two sites

(Figure 4), while exchange with the colony at Inishowen (Co. Donegal) is also thought possible but has not been validated (e.g. by movements of colour ringed birds). In 2022, NIEA conducted a simultaneous drone and vantage point survey of Castle Island (Little Skerrie), counting 193 AON, which was a 135% increase on 2021's boat-based count.

Periodic counts of the numbers at The Gobbins cliffs dating back to 1969 have shown fluctuating numbers in recent years, dropping to as low as two AON in 2007, returning to 33 AON in 2008. Unfortunately, The Gobbins has not been surveyed since 2019.

At Lough Neagh, only counts of individuals are made, as they are thought not to be breeding there (Lough Neagh Partnership). In 2022, 229 individual Cormorants were recorded in the lough.

Figure 3: Cormorant count (AON) at Bird Island, Strangford Lough, 1986–2022. The dashed line represents the Locally Weighted Least Squares Regression trend in Cormorant numbers over time. The shaded region represents the 95% confidence interval around the trend.

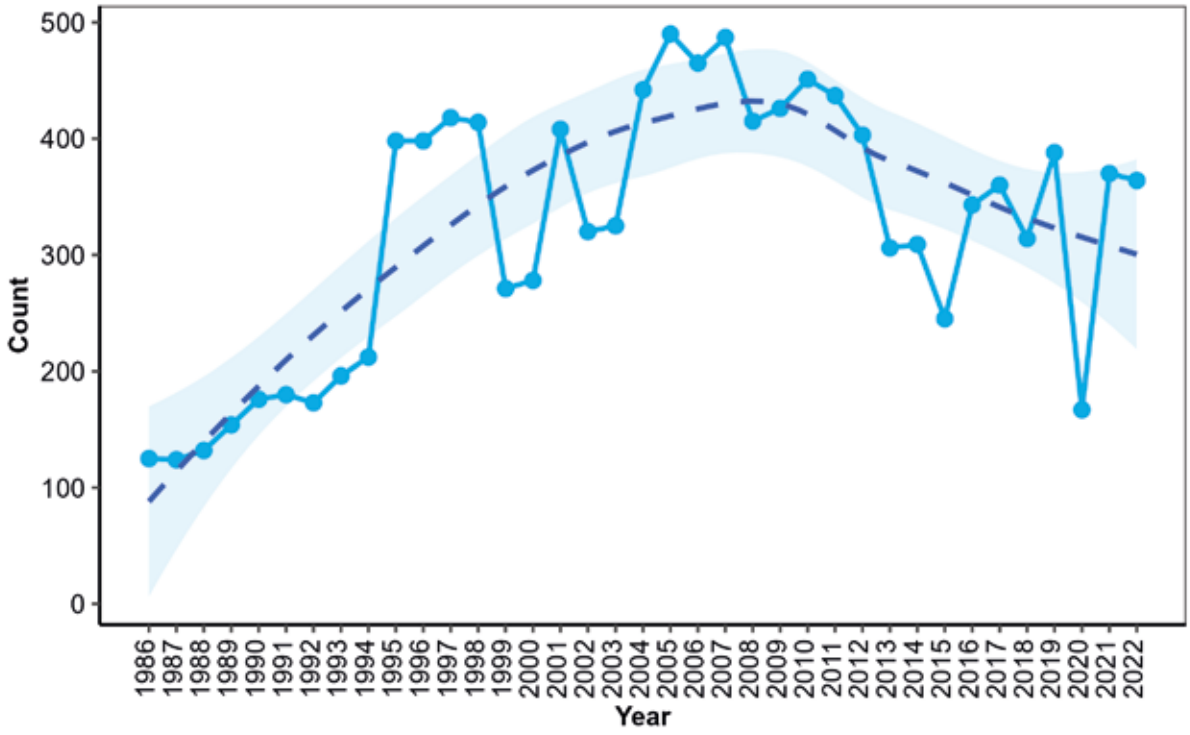
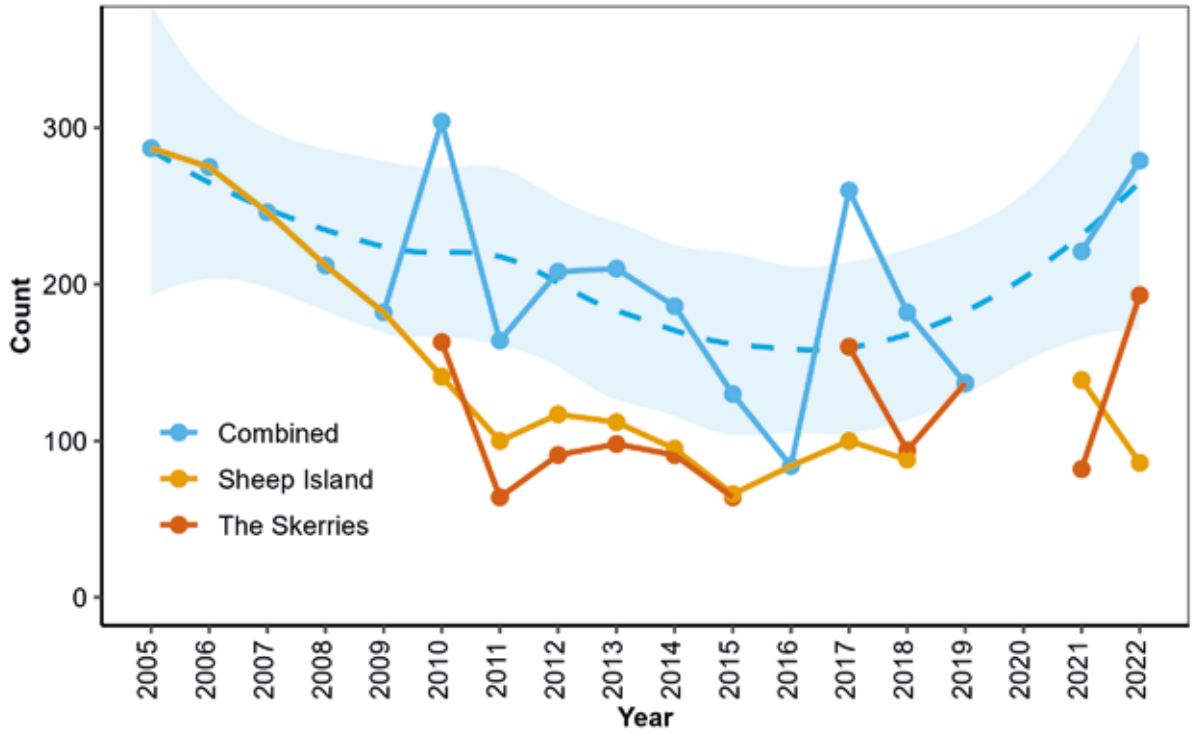


Figure 4: Cormorant counts (AON) at The Skerries and Sheep Island, 2005–2022. The Skerries were not surveyed before 2010, as it was believed that no Cormorants were present, and were not surveyed in 2016 or 2020. Sheep Island was not surveyed in 2019 or 2020. The 'Combined' count is a sum of both Sheep Island and Skerries counts, representing that these two sites may represent a single colony split across two sites. The dashed line represents the Locally Weighted Least Squares Regression trend in Cormorant numbers for both sites combined. The shaded region represents the 95% confidence interval around the trend.



Breeding success in 2022

Breeding success is not measured for any of the large colonies of Cormorants in Northern Ireland. Due to their breeding asynchrony, many visits are required to colonies through the season to assess the productivity of Cormorants. Historically, NIEA have made single-visit surveys to Sheep Island and The Skerries annually to count numbers of eggs and chicks in the Cormorant colonies, however the multiple visits required to generate true productivity estimates are not made.

Shag

Gulosus aristotelis

Conservation status: Amber-listed in the BoCCI4 (2020–26), Red-listed in the BoCC5 (2021), EC Birds Directive – migratory species, Least Concern – IUCN Red List (Europe).

KEVIN KIRKHAM

Overview

Synopsis: Slightly smaller than the Cormorant, the Shag is endemic to the northeast Atlantic and the Mediterranean. It is a marine inshore species that is almost never observed out of sight of land (Mitchell *et al.* 2004). The name of the Shag refers to the tuft of feathers on its head.

UK population size, abundance and breeding success trends: Over a third of the world population breeds in the UK and Ireland (JNCC 2021). The UK population size was estimated to be 26,565 AON at the last census in 1998–2002 (Mitchell *et al.* 2004). The UK breeding abundance index shows a 49% decline between 1986 and 2019, though this decline has been predominantly in Scotland with populations in England and Wales showing little change (JNCC 2021). Latest estimates put the UK population at 17,500 (13,500–20,500) (Woodward *et al.* 2020). Annual return rates of adults are usually in the order of 80–90% (JNCC 2021) but Shags are vulnerable to one-off events such as extreme winter storms and the return rate may drop to below 15% because of their impact (Frederiksen *et al.* 2008; Heubeck *et al.* 2015). The latest UK winter population estimate is 110,000 (Frost *et al.* 2021; Woodward *et al.* 2020).

The shortage of sandeels is thought to have contributed to low productivity in some years. In Scotland, Shag productivity was on average 1.28 chicks per pair between 1986 and 2019 (JNCC 2021). Population Viability Analysis calculations by Cook and Robinson (2010) suggested that if all demographic parameters remained the same (survival, clutch size, etc.) the UK population would decline by 9% over a period of 25 years.

Northern Ireland population size, abundance and breeding success trends: In Northern Ireland, the Shag is mostly restricted to Co. Antrim, with the largest colonies being at The Maidens (offshore from Larne) and Rathlin Island, with other breeding pairs scattered widely around the coast in smaller groups. The Seabird 2000 (1998–2002) census estimated that there were 301 AON in Northern Ireland, and that this was a decrease of 32% since the previous census (JNCC 2021).

The collection of productivity data in Northern Ireland has been limited; therefore, productivity estimates cannot be modelled at the regional-level (JNCC 2021).

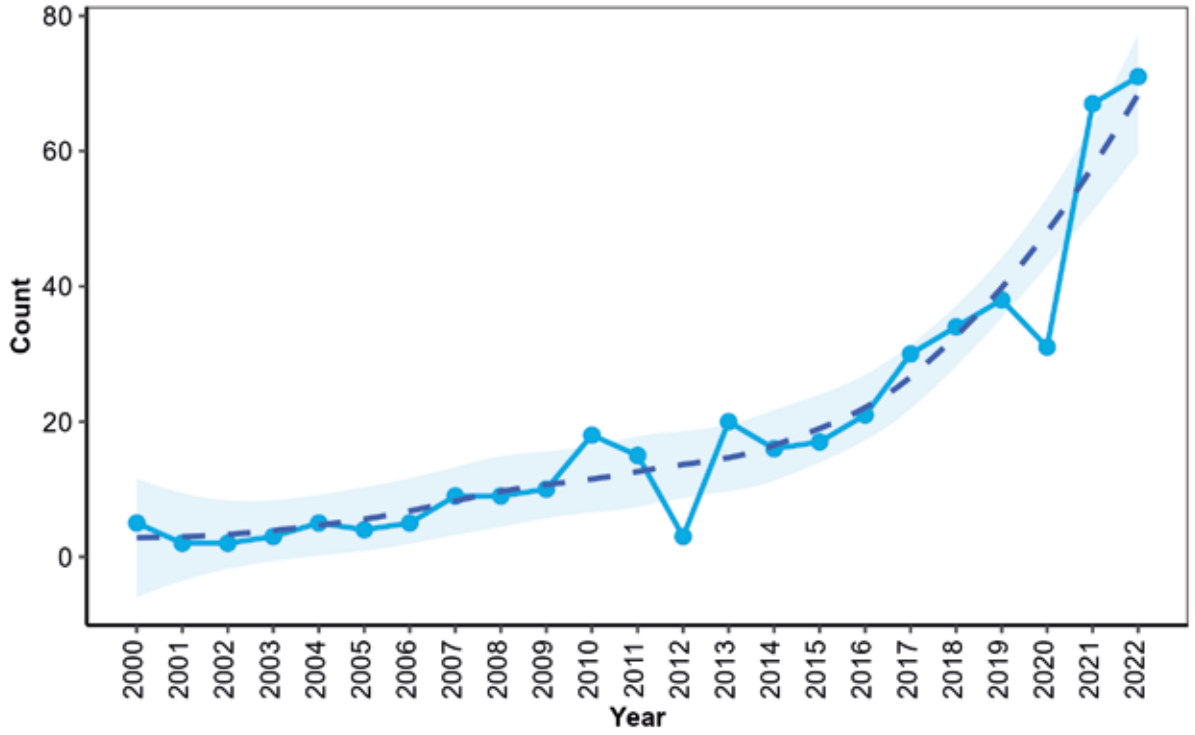
Abundance in 2022

While Shags stopped breeding in Strangford Lough in 2007, they have been recorded breeding in small numbers at several new locations in Northern Ireland since 2013 (Table 6, Appendix). The Maidens, a major colony for Shag in Northern Ireland, remains uncounted in recent years; the last count was an estimated 20 AON in 2018, down from 97 AON recorded in 2000. A full census of Rathlin Island and of the north Antrim coastline between Runkerry and Murlough occurred as part of the MarPAMM project in 2021 (Booth Jones *et al.* 2022). On Rathlin, Shag had increased by 28% since the 1998–2002 census to 74 AON. This year, RSPB made a reserve count of 42 AON.

On the north coast, 32 AON were recorded on The Skerries in 2021, a decline of 50% on the last count made in 2015 (although higher than the 11 AON recorded in 2000). In 2022, similar numbers to the 2021 counts were recorded at Downhill (13 AON) and in the Portrush sub-sites (6 AON, Table 6, Appendix).

Numbers at Muck Island have continued to increase since 2000, and reached a peak of 71 AON in 2022, the highest count for the site on record (Figure 5, Andy Crory, Ulster Wildlife). Although not counted in 2020 or 2021, numbers at The Gobbins nearby were at their highest recorded in 2018 (Table 6, Appendix), having increased by 11% since Seabird 2000 (1998–2002).

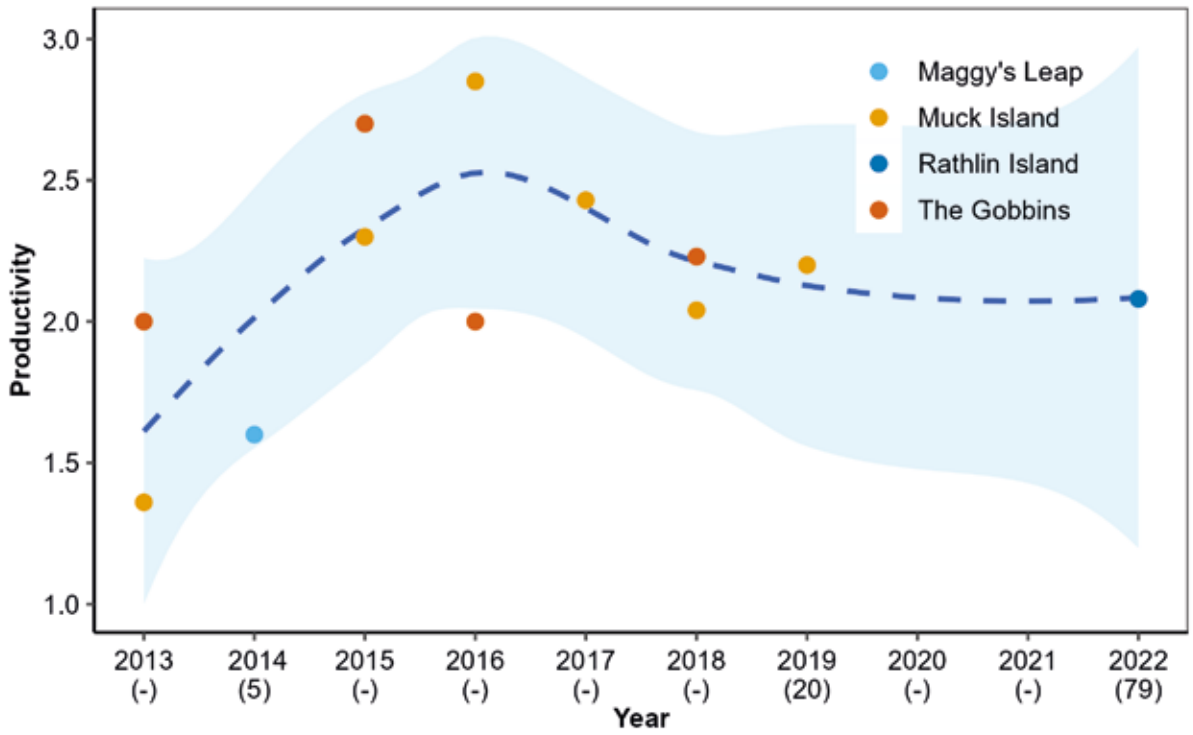
Figure 5: Shag counts (AON) at Muck Island, 2000-2022. The dashed line represents the Locally Weighted Least Squares Regression trend in Shag numbers over time at Muck Island. The shaded region represents the 95% confidence interval around the trend.



Breeding success in 2022

The only productivity data for the Shag in Northern Ireland were collected by the RSPB Life RAFT team on Rathlin Island at Rue West, where 79 AON had a productivity of 2.08 chick/AON. No data were collected in 2020 or 2021. In 2019, the Muck Island colony produced 44 chicks from 20 AON, a slightly higher figure than in the previous two years (Figure 6, Kerry Leonard, pers. comm.). Productivity data have not been recorded at The Gobbins since 2018. Figure 6 shows the yearly productivity data for Shag at Muck Island, The Gobbins, one recording from Maggy's Leap (2014) and one from Rathlin Island (2022), showing that there is considerable variation between years and sites. However, it is worth noting that the number of nests monitored per year is likely to also be variable and, in some cases, (e.g. 2014), very low. Although the trend in productivity appears to be fairly stable in recent years, the trend line has a large 95% confidence interval (blue shading) as a result of the small number of sites being monitored for Shag and records not being available for all years, therefore caution in interpreting this is required.

Figure 6: Productivity (Chicks/AON) for Shags 2013–2022 at four sites in Northern Ireland. No data were available for 2020 or 2021. The dashed line represents the Locally Weighted Least Squares Regression trend in productivity over time. The shaded region represents the 95% confidence interval around the trend. The total number of AON monitored per year is included in brackets under the year, with unknown numbers denoted by a hyphen (-).



Great Skua

Stercorarius skua

Conservation status: Amber-listed in the BoCCI4 (2020–2026), Amber-listed in the BoCC5 (2021), EC Birds Directive – migratory species, Least Concern – IUCN Red List (Europe).

REBECCA TANNER

Overview

Synopsis: Great Skuas are Herring Gull-sized, heavy-set seabirds, also colloquially known as 'Bonxies', a name that may derive from the old Norse for 'dumpy'. Great Skuas are known for their aggressive behaviour towards human intruders on their territories (Mitchell *et al.* 2004).

UK population size, abundance and breeding success trends: During the Seabird 2000 (1998–2002) census, the UK held 60% (9,634 AOT) of the world's population of Great Skua (Mitchell *et al.* 2004). Orkney and Shetland are the core breeding areas, but the species has now spread through northern Scotland to the Western Isles (JNCC 2021). The UK population is increasing, by 148% between the 1969–70 and 1985–88 censuses and by a further 26% by Seabird 2000 (JNCC 2021). Therefore, the recent breeding attempts on Rathlin are not surprising. Annual sampling of breeding abundance is insufficient to generate reliable population trends for the UK, country level or at individual sites.

Productivity across the UK has varied between 0.2 and 1.1 chicks per pair between 1986 and 2019 (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: Great Skua is a rare breeding species on the island of Ireland (Burke *et al.* 2020). The first occurrence of Great Skuas breeding in Northern Ireland occurred in 2011 on Rathlin Island. This pair has an average breeding success of 1.67 chicks per year since their arrival (JNCC 2021). In the Republic of Ireland, the first breeding occurred in the late 1990s in Co. Mayo (Mitchell *et al.* 2004) and there are now approximately 15 AOT, although no complete survey has been undertaken (Steve Newton, pers. comm.).

Abundance in 2022

RSPB reported the usual one AOT on the RSPB reserve on the island in 2022, while the 2021 MarPAMM surveys (Booth Jones *et al.* 2022) recorded a total of two AOT for the whole island, with other individuals also present.

Breeding success in 2022

The one pair on the RSPB reserve failed this year (RSPB).

Kittiwake

Rissa tridactyla

Conservation status: Red-listed in the BoCCI4 (2020–26), Red-listed in the BoCC5 (2021), EC Birds Directive – migratory species, Vulnerable – IUCN Red List (Europe).

KEVN KIRKHAM

Overview

Synopsis: The Kittiwake is the most numerous gull species in the world, and perhaps surprisingly, also the most numerous breeding gull in the UK (Woodward *et al.* 2020). Unlike the UK's other gull species, the Kittiwake is closely tied to the sea and adapted to nesting on steep sea cliffs, although it has recently taken to nesting on man-made structures (JNCC 2021).

UK population size, abundance and breeding success trends: In the Seabird 2000 (1998–2002) census, the UK population was estimated to be 378,847 AON, a decline of 25% since the previous census (Mitchell *et al.* 2004). Annual SMP data indicate that numbers had declined by 52% between 1986 and 2019 (JNCC 2021). The latest estimate of Kittiwake population size in the UK is 205,000 (175,000–255,000) (Woodward *et al.* 2020).

Kittiwake productivity in the UK has increased since a low point in 2007; between 2014 and 2019 it was 0.62 chicks per pair (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: Relative to the overall UK and Ireland trend since 1986, and its historical status, the Northern Ireland population is still reasonably stable. The largest colony by far in Northern Ireland is on Rathlin Island, the second largest colony at The Gobbins being only approximately 10% the size of the Rathlin Island colony. Other small colonies are dotted around the coast at Muck Island, Maggie's Leap, Castlerock, Carrick-a-rede, Dunluce and The Skerries. Colonies at Gun's Island and Strangford Lough have become extinct in the last 15 years. The last census estimated that Northern Ireland held 13,060 AON. Kittiwake have been upgraded from Amber-listed to Red-listed in BoCCI4 due to being classified Globally Vulnerable (Gilbert *et al.* 2021).

The collection of productivity data in Northern Ireland has been limited; therefore productivity estimates cannot be modelled at the regional-level (JNCC 2021).

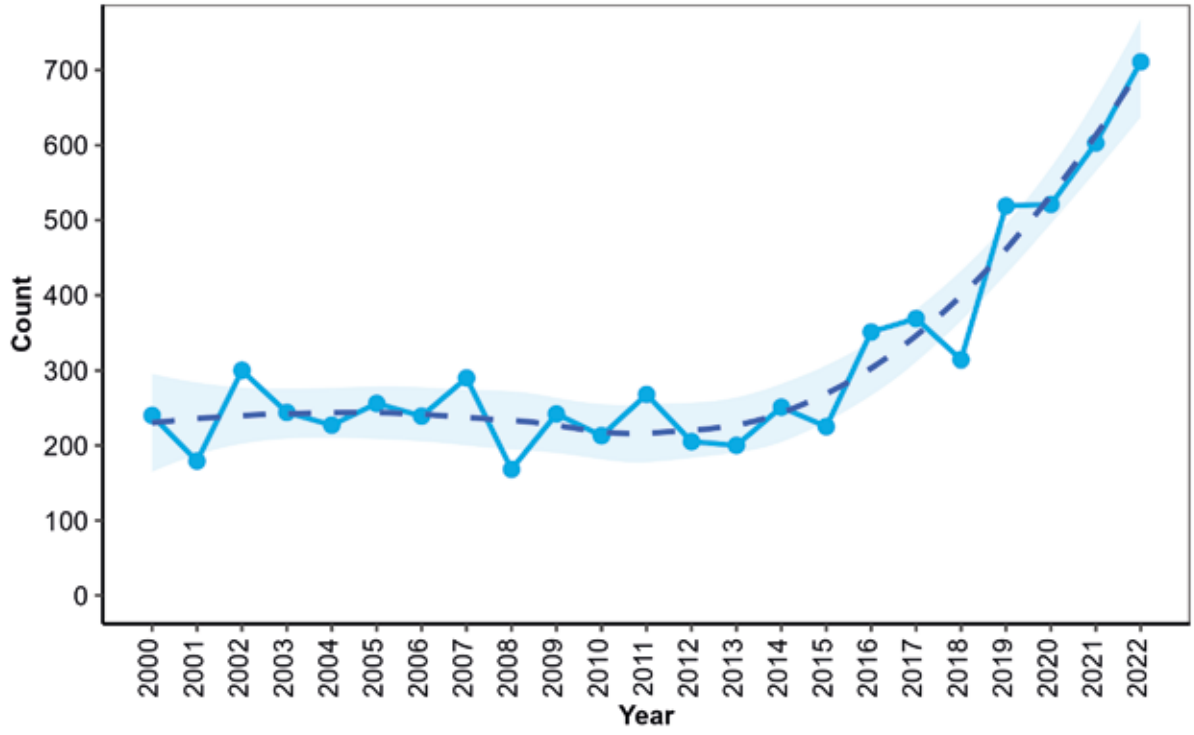
Abundance in 2022

Five sites received coverage for Kittiwake in 2022, all showing increases on 2021 apart from Maggy's Leap to Newcastle, which was surveyed later in the year than recommended (Table 3) and therefore may be an underestimate of true numbers of AON this year. The small number of Kittiwakes present at the RSPB Rathlin reserve increased from 61 in 2021 to 74 in 2022 (Table 6, Appendix), while the MarPAMM census of Rathlin in 2021 found that the Kittiwake population had increased on the island by 38% to 13,706 AON since the 1998–2002 census. MarPAMM surveys of the north Antrim coastline between Runkerry and Murlough in 2021 found that Kittiwake had declined by 10% to 792 AON (Booth Jones *et al.* 2022).

The colony at Portrush is divided into sub-sites to ease counting, and seven of the 10 sub-sites were monitored this year by NIEA. Kittiwake at Portrush appear to have increased annually during the census period (2015–2021) and this year increased again to 499 AON (Table 6, Appendix).

The population of Kittiwake monitored by Ulster Wildlife on Muck Island increased this year again to 711 AON (Figure 7), the highest total counted on the island since the first count for the SCR in 1987 (830 AON). Although there are no records since, in 2019 neighbouring sites at The Gobbins collectively held 1,145 AON, the highest count since 2007 and an increase of 68% over 2018 (Table 6, Appendix).

Figure 7: Kittiwake counts (AON) at Muck Island, 2000–22. The dashed line represents the Locally Weighted Least Squares Regression trend in Kittiwake numbers over time at Muck Island. The shaded region represents the 95% confidence interval around the trend

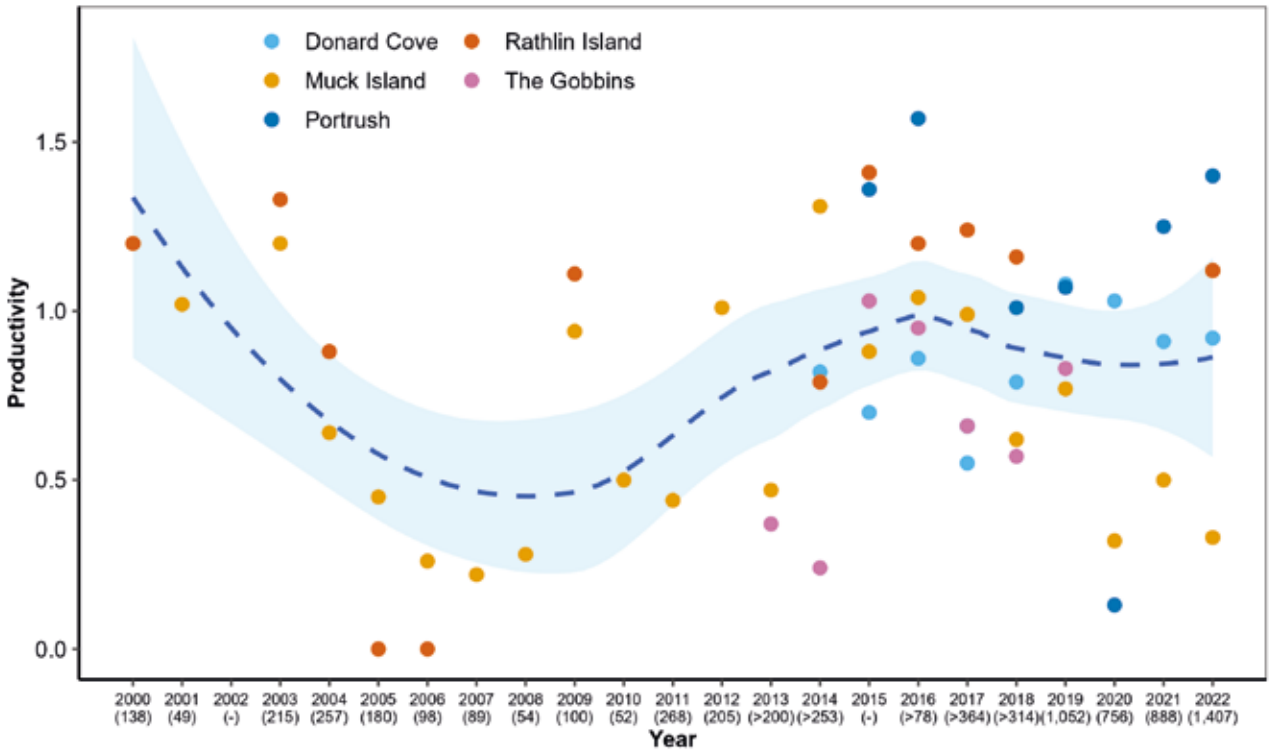


Breeding success in 2022

Four sites were monitored for productivity in 2022: Muck Island (Ulster Wildlife), Rathlin Island (RSPB), Donard Cove (Andy Carden) and Portrush (Cliff Henry). Fewer sites were monitored between 2000 and 2014 (Figure 8), and the addition of extra monitoring sites appears to have improved the average productivity figure for Northern Ireland since.

Compared to earlier declines, productivity appears to be fairly stable since a peak in 2016 (on average 0.89 chicks/nest in 2021, 0.94 in 2022), although varying between individual sites from year to year. However, while the total number of nests monitored for productivity in 2022 was excellent (1,407 AON), more certainty around overall Northern Irish trends could be gained by an increasing the number of sites monitored. In 2022, breeding success remained lowest at Muck Island (0.33 chicks/nest) and highest at Portrush (1.40 chicks/nest) for the second year running. The productivity at Donard Cove was 0.85 chicks/nest, which is lower than previous years, however counts were made a little later in the season this year.

Figure 8: Kittiwake productivity (chicks/AON) 2000–22 across five sites in Northern Ireland (Donard Cove, Muck Island, Portrush, Rathlin Island and The Gobbins). No data were available for 2002. The dashed line represents the Locally Weighted Least Squares Regression trend in productivity over time. The shaded region represents the 95% confidence interval around the trend. The total number of AON monitored per year is included in brackets under the year, with unknown numbers denoted by a hyphen (-).



Black-headed Gull

Chroicocephalus ridibundus

Conservation status: Amber-listed in the BoCCI4 (2020–26), Amber-listed in the BoCC5 (2021), EC Birds Directive – migratory species, Least Concern – IUCN Red List (Europe), Northern Ireland Priority species (Northern Ireland Biodiversity Strategy 2002).

GRAHAM CATLEY / BTO

Overview

Synopsis: Black-headed Gulls are small gulls and found throughout the UK, both around the coasts and inland. They are particularly abundant in the winter, when the UK breeding population is joined by migrants from continental Europe (Wernham *et al.* 2002).

UK population size, abundance and breeding success trends: The Black-headed Gull is a common breeding species in the UK, with 5.6% of the world population recorded during Seabird 2000 (1998–2002), around 140,000 pairs (Mitchell *et al.* 2004). It is unclear how the population may compare to previous decades because previous UK and Ireland surveys were incomplete, with many inland colonies remaining uncounted. Therefore, although Seabird 2000 showed an apparent increase, this was due to more comprehensive surveying that may have masked an actual population decline (JNCC 2021). SMP trends suggest the population has increased by 21% since 1986 (JNCC 2021). The UK is estimated to host nearly 2,200,000 individuals in the winter (Burton *et al.* 2013; Woodward *et al.* 2020).

In the UK, productivity fluctuates from 0–1.30 chicks per AON, however the most recent UK productivity average was 0.48 chicks per pair in 2019 (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: In Northern Ireland, the Black-headed Gull is a widespread breeding species, occurring in relatively few large colonies, with major concentrations at Strangford Lough, Belfast Lough, Larne Lough, Copeland Islands, Lough Neagh and Lower Lough Erne. In the Seabird 2000 (1998–2002) census, 4,037 AON were counted in Northern Ireland, a decline of 12% since the previous census. The winter population of Northern Ireland is estimated to be 44,000 individuals (Burton *et al.* 2013; Woodward *et al.* 2020). Black-headed Gull has been downgraded from Red-listed to Amber-listed in BoCCI4 due to less-severe declines in recent years (Gilbert *et al.* 2021).

The collection of productivity data in Northern Ireland has been limited; therefore productivity estimates cannot be modelled at the regional-level (JNCC 2021). The potential impact of predators such as American Mink *Neovison vison* (Craik 1997), Otters *Lutra lutra* and rats *Rattus* spp. on inland colonies in Northern Ireland are largely unstudied. Collecting productivity data for Black-headed Gulls is a high priority.

Abundance in 2022

The MarPAMM census of Rathlin found that Black-headed Gull had almost declined to extinction (-99%) since the 1998–2002 census, with only five AON counted on the island in 2021, compared to 383 AON in 1999.

Numbers at Larne Lough grew from just 109 AON in 1987 to a high of 3,102 AON in 2016 (Figure 9; Table 6, Appendix). This was the first time in several years that a completely accurate census was carried out. While the completeness of the 2016 count is likely to have been responsible for some of the increase in recorded numbers, Black-headed Gull populations can fluctuate between years, something which has been previously seen at Larne Lough. In 2022, 2,089 AON were counted, a slight decline on numbers in 2021.

At RSPB's Belfast Harbour reserve, Black-headed Gull numbers were significantly higher than have previously been recorded at the site, with an estimated 1,500 AON, up 114% on 2021's count. Black-headed Gulls have been stable at RSPB's Portmore Lough reserve over the past few years, with 126 AON recorded in 2022, only a slight increase on those counted in 2021 (121 AON, Table 6, Appendix).

This year, 1,297 AON were counted by the National Trust and WWT in Strangford Lough (Table 6, Appendix), where the breeding population appears to have mostly stabilised since 2013 after a large decline from the peak seen in the early 1990s (Figure 10). A breakdown of counts across different islands can be found in the Strangford report on page 79. On Cockle Island in Outer Ards, the National Trust counted 226 Black-headed Gull AON.

Unusually, one AON was observed on Lighthouse Island in the Copeland archipelago in 2021, but this was not observed again this year (although monitoring was not comprehensive of all gull species).

There are also inland breeding populations of Black-headed Gulls in Northern Ireland. In Co. Fermanagh, Moorlough Lake supported 95 AOT in 2018 but has not been counted since, while Lower Lough Erne had 1,255 AON in 2022, the lowest record since 2018 (Table 6, Appendix). In Lough Neagh, 15 island sites were surveyed three times between May and June 2022 by the Lough Neagh Partnership (excluding Portmore Lough RSPB reserve), from which average counts are reported in Table 6. Together these totalled 4,019 individuals. Abundance data are challenging to collect consistently from the Lough Neagh islands making between-year comparisons difficult, particularly given late counts due to COVID-19 restrictions in 2020, and the relative merits and drawbacks of reporting peak counts or average counts. A count of the main breeding islands gave an estimate of 11,595 individuals in 2016, but numbers have fallen in recent years with approximately 8,120 individuals counted in 2017 and 8,906 in 2018 (Table 6, Appendix; Bob Davidson and Stephen Foster, pers. comm.). Lough Neagh supported 30,000 breeding pairs of Black-headed Gulls on 12 islands in the 1980s; subsequently the gulls have abandoned breeding on Shallow Flat and Coney Island Flat, and have decreased in number on Padian Island, Owen Roe and Scaddy Island (Allen & Mellon 2018).

Figure 9: Black-headed Gull counts (AON) at Larne Lough, 1987–2022. No counts took place 1988–93, 2001–04, 2010, and an incomplete count in 2020. The dashed line represents the Locally Weighted Least Squares Regression trend in Black-headed Gull numbers over time at Larne Lough. The shaded region represents the 95% confidence interval around the trend.

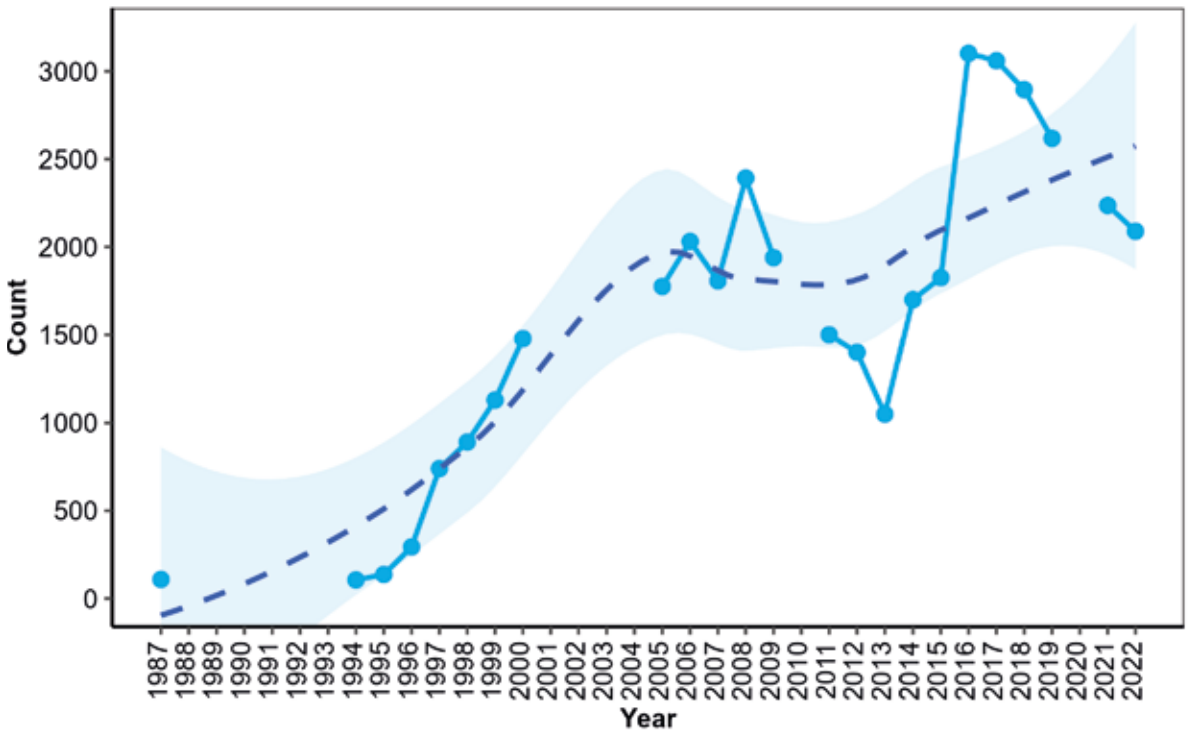
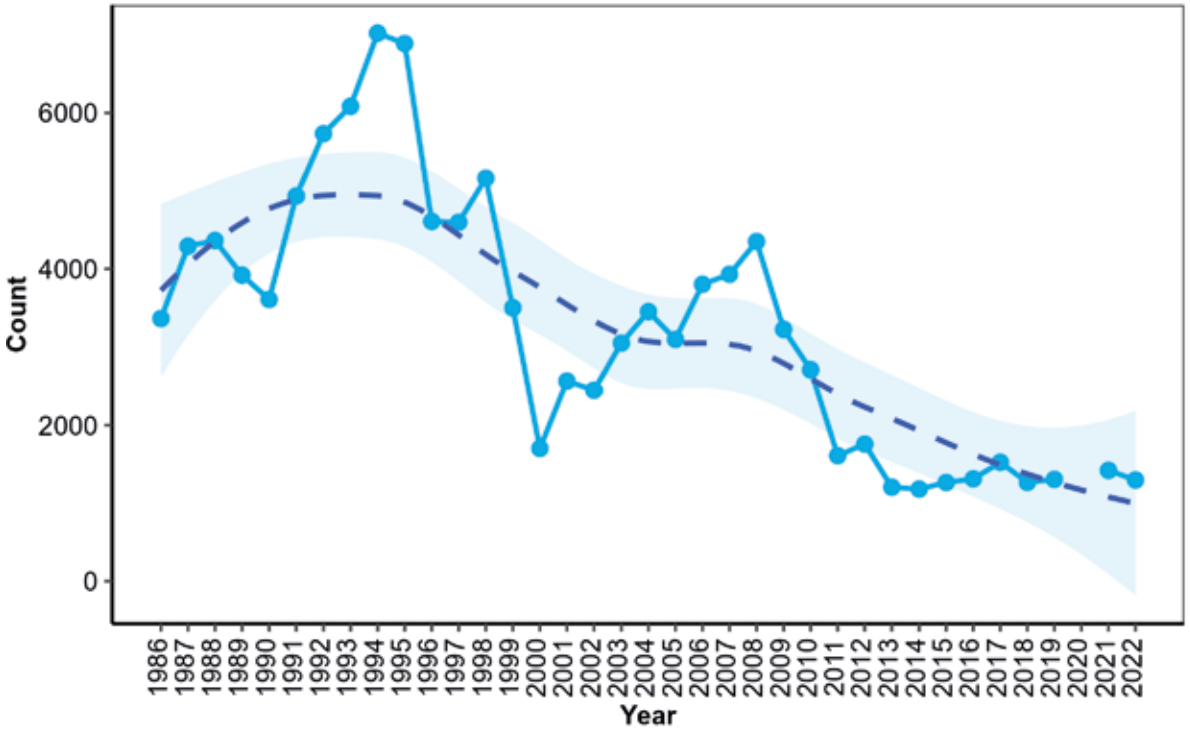


Figure 10: Black-headed Gull counts (AON) at Strangford Lough, 1986–2022. No counts took place in 2020. The dashed line represents the Locally Weighted Least Squares Regression trend in Black-headed Gull numbers over time at Strangford Lough. The shaded region represents the 95% confidence interval around the trend.



Breeding success in 2022

No productivity data for Black-headed Gulls were collected in 2022. Productivity data from Portmore Lough reserve were impossible to collect this year without major disturbance (RSPB), but in 2021 Black-headed Gulls fledged 125 chicks from 97 pairs (1.29 chicks/AON), higher than the last record made in 2019 at the reserve (1.08 chicks/AON). The last record of breeding success at Larne Lough was in 2019, which was approximately 1.50 chicks/AON (RSPB).

Mediterranean Gull

Ichtyyaetus melanocephalus

Conservation status: Amber-listed in the BoCCI4 (2020–26), Amber-listed in the BoCC5 (2021), EC Birds Directive – Annex 1 and migratory species, Least Concern – IUCN Red List (Europe).

ALLAN DREWITT / BTO

Overview

Synopsis: Slightly larger and stockier than the Black-headed Gull, and with a stouter bill, the Mediterranean Gull is a relative newcomer to the UK and Ireland's breeding seabird assemblage. Mediterranean Gulls expanded their range and population size from their traditional distribution around the Black Sea and eastern Mediterranean in the 1950s and 1960s (JNCC 2021), with the first confirmed breeding in the UK occurring in Hampshire in 1968 (Slack 2007).

UK population size, abundance and breeding success trends: From just one pair in the 1985–88 census there were over 100 AON during Seabird 2000 (1998–2002) and it is estimated that the current UK population is somewhere between 1,500 to 2,000 AON (JNCC 2021). Most large colonies are located in south and south-east England, although the species' distribution is expanding northward, with smaller colonies becoming established elsewhere. An estimated 4,000 Mediterranean Gulls winter in the UK (Woodward *et al*. 2020).

Few productivity data are collected for Mediterranean Gulls, and as result productivity at the UK-level is not reported. Productivity at one of the UK's largest colonies, in Langstone Harbour, England, increased from 1.04 to 1.38 chicks per pair between 2015 and 2019 (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: Mediterranean Gull is a rare breeding species on the island of Ireland (Burke *et al.* 2020). After first breeding in Co. Antrim in 1995, initially between one and three AON were recorded annually in Northern Ireland, across three different sites. Numbers have gradually increased, however, particularly since Mediterranean Gulls started breeding at Belfast Lough RSPB reserve in 2016.

The collection of productivity data in Northern Ireland has been limited; therefore productivity estimates cannot be modelled at the regional-level (JNCC 2021).

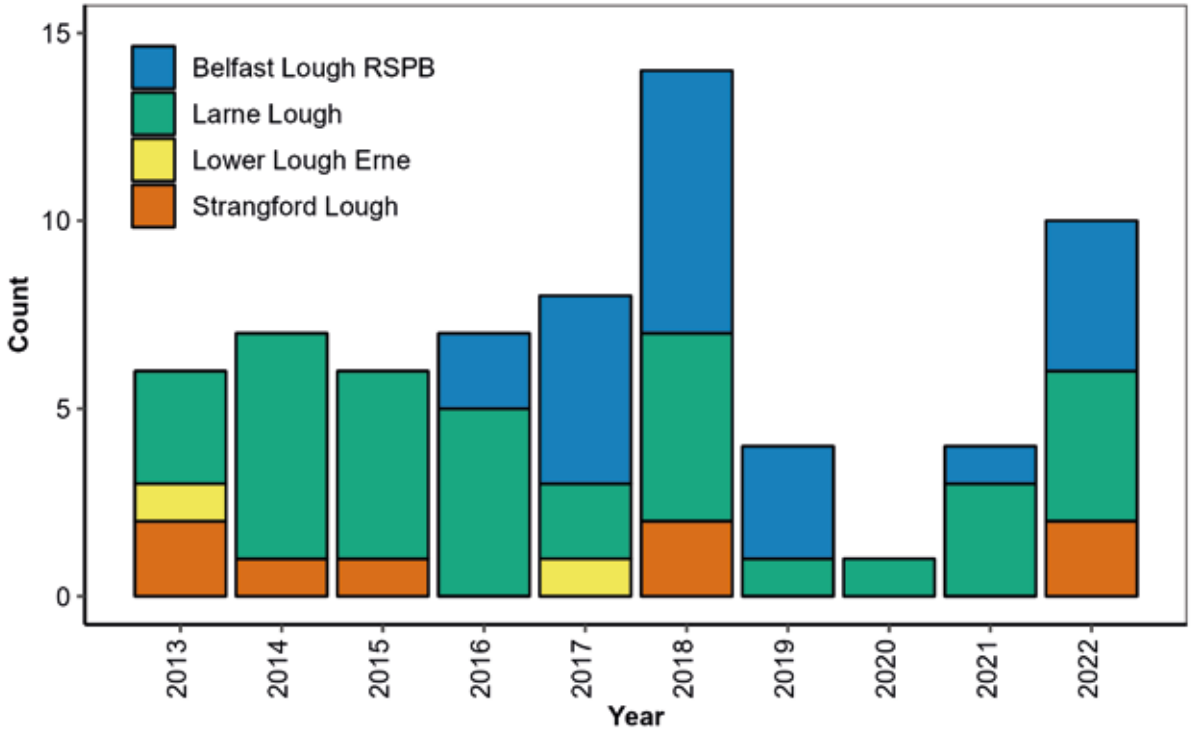
Abundance in 2022

Numbers of breeding Mediterranean Gulls appear to have dropped since the peak in 2018 (14 AON, Table 6, Appendix), although due to COVID-19 fieldwork restrictions, few records were made in 2020. While in 2021, there were only four confirmed breeding pairs, in 2022 numbers had again risen with a total of 10 pairs between Strangford, Larne and Belfast Lough (Figure 11). One male Mediterranean Gull returned to Lower Lough Erne this year and was believed to have incubated two nests, but there was no evidence of successful hatching (RSPB).

Breeding success in 2022

Due to the low number of breeding pairs in Northern Ireland, assessment of breeding success is very limited. However, five chicks were fledged from the four nests at Belfast Lough (1.25 chicks/AON) and two from the four nests (0.50 chicks/AON) at Larne Lough (both sites monitored by RSPB), therefore the overall figure for 2022 was 0.88 chicks/AON, similar to 2021 (0.75 chicks/AON).

Figure 11: Cumulative Mediterranean Gull count (AON) in Northern Ireland, 2013–22. No data were available for 2020 from Belfast Lough or Strangford Lough. The total bar height represents the number of Mediterranean Gull pairs per year, and the colour represents the number in each site.



Common Gull

Larus canus

Conservation status: Amber-listed in the BoCCI4 (2020–26), Amber-listed in the BoCC5 (2021), EC Birds Directive – migratory species, Least Concern – IUCN Red List (Europe).

EDMUND FELLOWES / BTO

Overview

Synopsis: A dainty gull, resembling a small Herring Gull, the Common Gull nests colonially around coasts and inland sites. In North America the species is often referred to as the Mew Gull. The Common Gull can often be seen paddling their feet to encourage worms to surface in grassy areas (Vernon 1972).

UK population size, abundance and breeding success trends: Scotland held 98% of breeding Common Gulls in the UK during Seabird 2000 (1998–2002) (Mitchell *et al.* 2004), so the rest of the UK is relatively insignificant for this species. Over half (57%) of the breeding Common Gulls in Seabird 2000 bred inland (Mitchell *et al.* 2004). In the Seabird 2000 census, there were an estimated 48,714 AON in the UK but because inland colonies were not counted in previous censuses, a comprehensive estimate of Common Gull population change is not available. Due to its importance in the UK context, the Scottish trend can be used cautiously to represent the UK-level trend and shows a 75% decline in coastal breeding Common Gulls between the last census (1988–2002) and 2019 (JNCC 2021). The winter population of Common Gull in the UK is estimated to be 710,000 (680,000–730,000) (Burton *et al.* 2013; Woodward *et al.* 2020).

Common Gull productivity is not well studied at the UK-scale, but a long-term study on the impact of American Mink predation on gulls and terns in western Scotland found that between 1989 and 2019 average productivity was 0.38 chicks per pair (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: Historically the Common Gull was a scarce breeding species in Northern Ireland, belying its name. However, coastal-nesting Common Gulls increased in their population size from 192 to 383 AON between the 1985–88 and 1998–2002 censuses, and small numbers have appeared at several locations, although unfortunately not formally monitored (Kerry Leonard, pers. comm.). For example, one such new colony was discovered in late July 2013 at Torr Head, Co. Antrim. By far the largest concentrations are on the Copeland Islands and at Strangford Lough, and inland at Lower Lough Erne. Approximately 10,000 Common Gulls visit Northern Ireland in the winter (Burton *et al.* 2013; Woodward *et al.* 2020).

The collection of productivity data in Northern Ireland has been limited; therefore productivity estimates cannot be modelled at the regional-level (JNCC 2021).

Abundance in 2022

Four areas around Northern Ireland have been regularly monitored for Common Gull in recent years: Strangford Lough, Larne Lough, Outer Ards and Lower Lough Erne (Table 6, Appendix). At these sites Common Gulls have generally increased over time. Numbers of Common Gulls grew steadily in Strangford Lough in the 1990s, but since have been less stable, with a huge increase in the 2000s followed by a decline in the early 2010s (Figure 12). In 2022, the count was 449 AON, the highest since the peak in 2010 (Figure 12, Table 6, Appendix). A breakdown of counts across different islands can be found in the Strangford report on page 79.

The next largest colony is in Lower Lough Erne (Figure 13, Table 6, Appendix), where an estimated 238 were counted in 2022, which was very similar to 2021's count of 249 AON. While counts were not carried out in 2020, in 2019 it was not possible to count one important colony at Lower Lough Erne, so although the count of 337 AON was the highest on record (Table 6, Appendix), this was probably an underestimate (Brad Robson, RSPB, pers. comm.).

Numbers of Common Gull at the smaller Larne Lough colony have been variable in recent years but in 2022 saw their greatest count on record, of 45 AON, and a 61% increase on 2021. Up to nine AON have been recorded annually in the Outer Ards since 1986, and five AON were recorded in 2022 (Table 6, Appendix).

Figure 12: Common Gull counts (AON) at Strangford Lough, 1985–2022. No counts were made in 2001 or 2020. The dashed line represents the Locally Weighted Least Squares Regression trend in Common Gull numbers over time. The shaded region represents the 95% confidence interval around the trend.

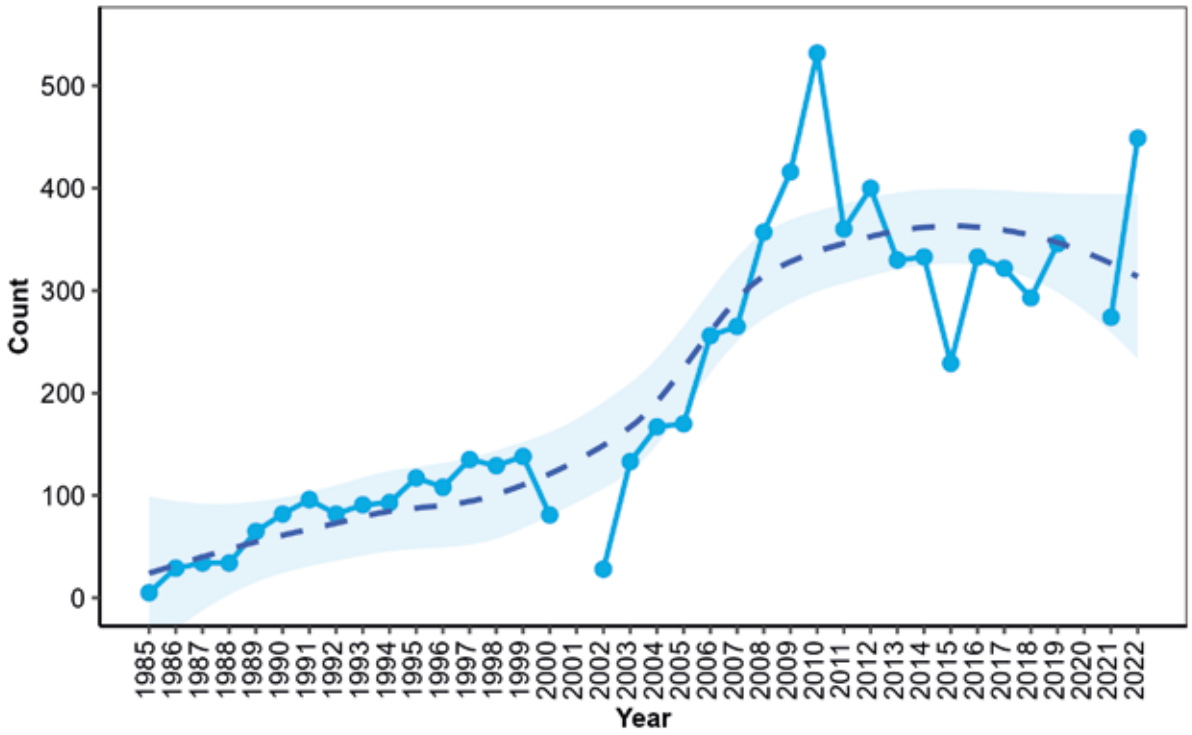
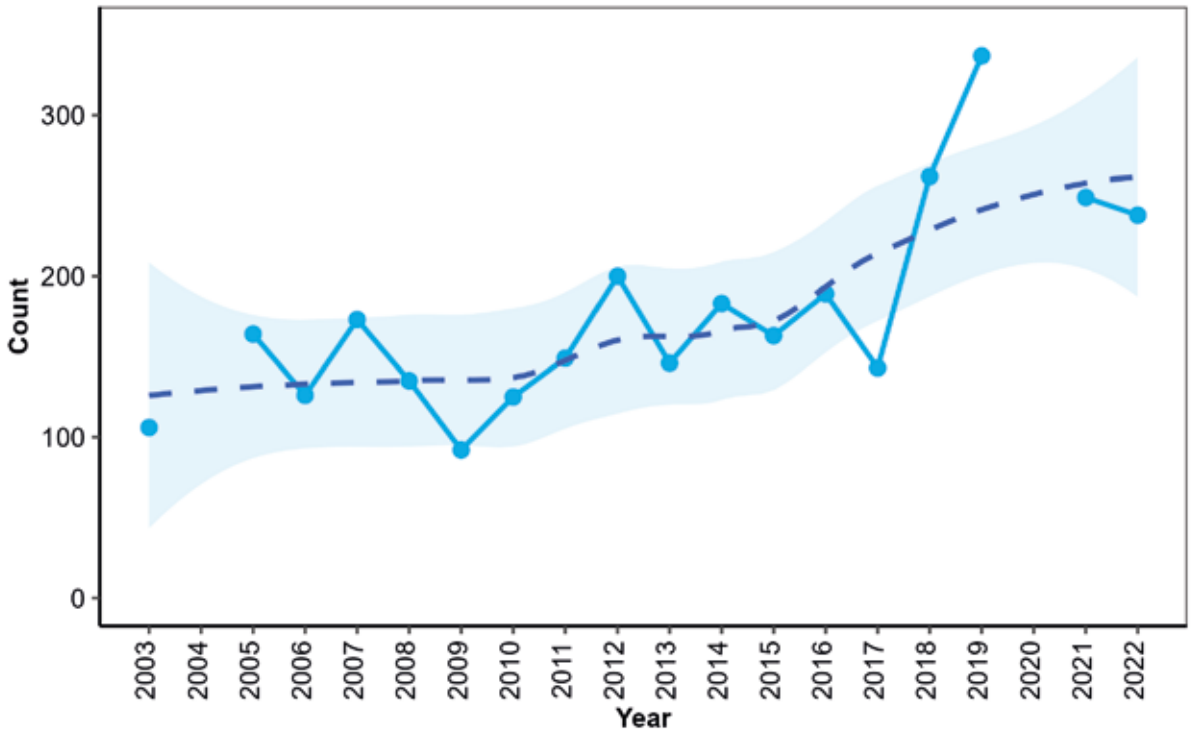


Figure 13: Common Gull counts (AON) at Lower Lough Erne, 2003–2022. No counts were made in 2004 and 2020. The dashed line represents the Locally Weighted Least Squares Regression trend in Common Gull numbers over time. The shaded region represents the 95% confidence interval around the trend.



Outside regularly monitored areas, other aggregations of Common Gull exist primarily on the Copeland Islands and on Rathlin Island. On the Copeland Islands, although numbers have dropped, birds have spread out from a few large sub-colonies to form new satellite sub-colonies around the shore of all three islands. The Copeland Islands have not been completely surveyed since 2012, when there were 452 AON, and down from a peak of 830 AON in 2009. In 2018, 15 AON were recorded on Lighthouse Island. The MarPAMM census of Rathlin Island found that the Rathlin population has stayed fairly stable since the 1998–2002 census, at 69 AON (an 8% increase), and in 2022, RSPB recorded 42 AON on their island reserve.

A few Common Gulls breed at Carlingford Lough, and in 2021 there were only five AON (Table 6, Appendix).

Breeding success in 2022

The only breeding season data to be collected in 2022 were at Larne Lough by the RSPB, where 45 AON produced 51 chicks (1.13 chicks/AON), an improvement on previous years' productivity (2021, 0.57; 2020, 0.59).

Lesser Black-backed Gull

Larus fuscus

Conservation status: Amber-listed in the BoCCI4 (2020–26), Amber-listed in the BoCC5 (2021), EC Birds Directive – migratory species, Least Concern – IUCN Red List (Europe).

EDMUND FELLOWES / BTO

Overview

Synopsis: Lesser Black-backed Gulls nest colonially often with other gull species, particularly Herring Gulls (Mitchell *et al.* 2004). However, unlike Herring Gulls, many Lesser Black-backed Gulls from the UK migrate to the Iberian Peninsula or North Africa during the non-breeding period (Mitchell *et al.* 2004; Rock 2002).

UK population size, abundance and breeding success trends: During Seabird 2000 (1998–2002) the UK held 38% of the estimated world population. At this time, the breeding population was estimated at 111,960 AON, an increase of 40% over the previous census period (JNCC 2021). However, with the species' spread to inland urban sites, it is likely that some colonies remained uncounted. As a result, the downwards trend in the Lesser Black-backed Gull abundance index over the last 20 years is based only on natural-nesting gulls and may not be representative of the UK whole (JNCC 2021). Although many of the UK's breeding Lesser Black-backed Gulls migrate during the winter, the winter population is estimated to be 130,000 (120,000–130,000) (Burton *et al.* 2013; Woodward *et al.* 2020), boosted by an influx of birds from Iceland and Scandinavia.

At the UK-level, productivity measured at natural-nesting colonies (defined as moors, cliffs, marshes, beaches and other areas of semi-natural habitat, i.e. non-urban) was 0.52 chicks per pair between 1989 and 2019 (JNCC 2021). The factors causing low productivity in Lesser Black-backed Gulls are not fully understood but include predation at some colonies. There is a lack of equivalent productivity estimates for urban sites.

Northern Ireland population size, abundance and breeding success trends: The Lesser Black-backed Gull is a widespread breeding species in Northern Ireland, mainly in a few large colonies at Strangford Lough, Copeland Islands, and inland at Lower Lough Erne and Lough Neagh. There are smaller numbers at Rathlin Island, The Skerries and Muck Island. Across Northern Ireland as a whole, numbers of coastal-nesting Lesser Black-backed Gulls doubled between the 1969–70 and 1985–88 censuses, and increased further to 131% by 1998–2002, when 1,033 AON were counted. Inland colonies were only censused for the first time in Seabird 2000 (940 AON), so trends are unavailable for these sites (JNCC 2021). Central Belfast was the only urban colony to be surveyed in Seabird 2000, with 63 AON recorded (Mitchell *et al.* 2004), but the full extent of urban nesting Lesser Black-backed Gulls is unknown in Northern Ireland. As many as 10,000 Lesser Black-backed Gulls may occur in Northern Ireland in the winter (Burton *et al.* 2013; Woodward *et al.* 2020).

The collection of productivity data in Northern Ireland has been limited; therefore productivity estimates cannot be modelled at the regional-level (JNCC 2021).

Abundance in 2022

Lower Lough Erne supports a large proportion of the Lesser Black-backed Gulls in Northern Ireland, and in 2022 this population was estimated to be 1,653 AON, the maximum on record for the site. However, this count includes the 2019 record of 765 AON at Rabbit Island, as this particular colony could not be visited in 2022 (RSPB). Another large concentration is found in Strangford Lough where, with the exception of a dip in the late 1990s and early 2000s, the population has risen since the records began in 1987. In 2022, 339 AON were recorded, 23% below the highest-ever count made in 2021. A breakdown of counts across different islands can be found in the Strangford report on page 79.

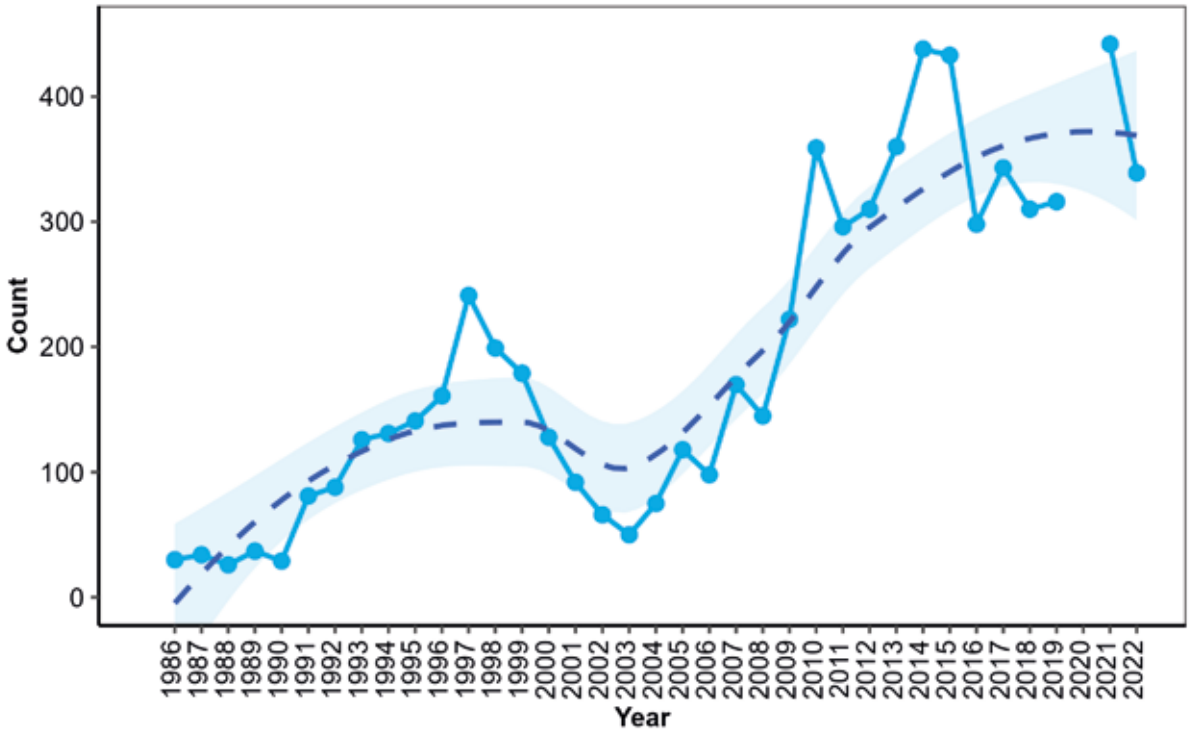
In Lough Neagh, 15 island sites were surveyed three times between May and June 2022 by the Lough Neagh Partnership (excluding Portmore Lough RSPB reserve), from which average counts are reported in Table 6. Together these totalled 1,543 individuals. Abundance data are challenging to collect consistently from the Lough Neagh islands making between-year comparisons difficult.

While the loughs are generally well covered for Lesser Black-backed Gulls, coastal colonies are less regularly counted, or coverage is incomplete. Addressing part of this gap, the MarPAMM census of Rathlin found that Lesser Black-backed Gulls had increased on the island by 309% to 519 AON since the 1998–2002 census, while between Runkerry and Murlough, they increased by 1,200% to 91 AOT/AON (Booth Jones *et al.* 2022). Additionally, a volunteer survey of The Skerries counted 537 AON in 2021, a significant and under-recorded population.

A volunteer team led by the Copeland Bird Observatory surveyed large gulls on Lighthouse Island in 2018 2019, 2021 and 2022. The estimated count in 2022 was 602 AON, a 47% increase over the count in 2021, making Lesser Black-backed Gulls nearly as common on Lighthouse Island as Herring Gulls this year (Table 6, Appendix). Gulls nesting on Big Copeland and Mew Island remain uncounted.

True numbers of urban-nesting gulls remain difficult to quantify, however in 2018 and 2019 NIEA-funded surveys of central Belfast recorded a peak of 221 AON (Booth Jones, *et al.* 2022). While much higher than the last record made for the 1998–2002 census (63 AON), this is still likely to be an underestimate due to the complexity of the roofscape in the survey area. Urban nesting appears to be an increasing phenomenon in Northern Ireland, and records of roof nesters from volunteers would be welcome.

Figure 14: Lesser Black-backed Gull counts (AON) in Strangford Lough, 1986–2022. No data were collected in 2020. The dashed line represents the Locally Weighted Least Squares Regression trend in Lesser Black-backed Gull numbers over time. The shaded region represents the 95% confidence interval around the trend.



Breeding success in 2022

No colonies were monitored for breeding success in 2022.

Herring Gull

Larus argentatus

Conservation status: Amber-listed in the BoCCI4 (2020–26); Red-listed in the BoCC5 (2021), EC Birds Directive – migratory species, Near Threatened – IUCN Red List (Europe). Northern Ireland Priority species (Northern Ireland Biodiversity Strategy 2002).

KEVIN KIRKHAM

Overview

Synopsis: The Herring Gull is slightly larger than the Lesser Black-backed Gull. It was historically widespread in Britain and Ireland and is largely resident (Mitchell *et al.* 2004). It nests in a range of habitats, from rocky coastlines to rooftops, but is less widespread inland compared to the Lesser Black-backed Gull. Although quite common on roofs now, this behaviour was first observed in the 1920s in the south-west of England (Witherby,1937).

UK population size, abundance and breeding success trends: Herring Gulls suffered a steep decline in the late 1980s, largely due to botulism (Mitchell *et al.* 2004). Between the 1969–70 and 1985–88 censuses, Herring Gulls declined by 43% and declined a further 13% by 1998–2002, to 130,230 AON (JNCC 2021). However, with the species' spread to inland urban sites, it is likely that some colonies remained uncounted. The SMP report does not produce a combined urban- and natural-nesting abundance index for Herring Gull due to the low sample from urban sites, but the natural-nesting index for 2019 was 56% below the 1986 baseline (JNCC 2021). Based on existing UK demographic parameters (survival, clutch size, etc.) Cook and Robinson (2010) predicted a 60% decrease in the national population over 25 years. During the winter, visitors from Scandinavia swell the Herring Gull population to around 740,000 (710,000–780,000) (Burton *et al.* 2013; Woodward *et al.* 2020).

While in the previous decade productivity was variable with an underlying declining trend, between 2000 and 2010 productivity stabilised at around 0.60 chicks per pair and was 0.57 in 2019 (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: The population in Northern Ireland declined by 96% between the 1985–88 and 1998–2002 censuses to just 709 AON (Cramp *et al.* 1974; JNCC 2021; Mitchell *et al*. 2004). Concentrations of Herring Gulls occur on the Copeland Islands and at Strangford Lough. Smaller colonies are on Rathlin Island, Burial Island, Muck Island and The Skerries. The population of Rathlin Island declined from 4,037 AOT in 1985 to just 19 AOT in 1999 (Mitchell *et al.* 2004). A similar decline occurred on the Copeland Islands, from approximately 7,000 AOTs in 1985 to 225 AOT in 2004. The figures for Strangford Lough mirror this trend, with a large and rapid decline in the mid-1980s, numbers reaching a low point just after the turn of the century. Since 2007, numbers of AOT at Copeland and Strangford have shown sustained growth. Herring Gull has been downgraded from Red-listed to Amber-listed in BoCCI4 due to less severe declines in recent years (Gilbert *et al.* 2021). As many as 10,000 Herring Gulls may occur in Northern Ireland in the winter (Burton *et al*. 2013; Woodward *et al.* 2020).

The collection of productivity data in Northern Ireland has been limited; therefore productivity estimates cannot be modelled at the regional-level (JNCC 2021).

Abundance in 2022

The primary population of Herring Gulls in Northern Ireland is found in Strangford Lough, where numbers have been steadily increasing after a decline in the late 1980s and 1990s (Figure 15). The 2022 count of 1,523 AON is the largest count since 1987 (2,825 AON). A breakdown of counts across different islands can be found in the Strangford report on page 79.

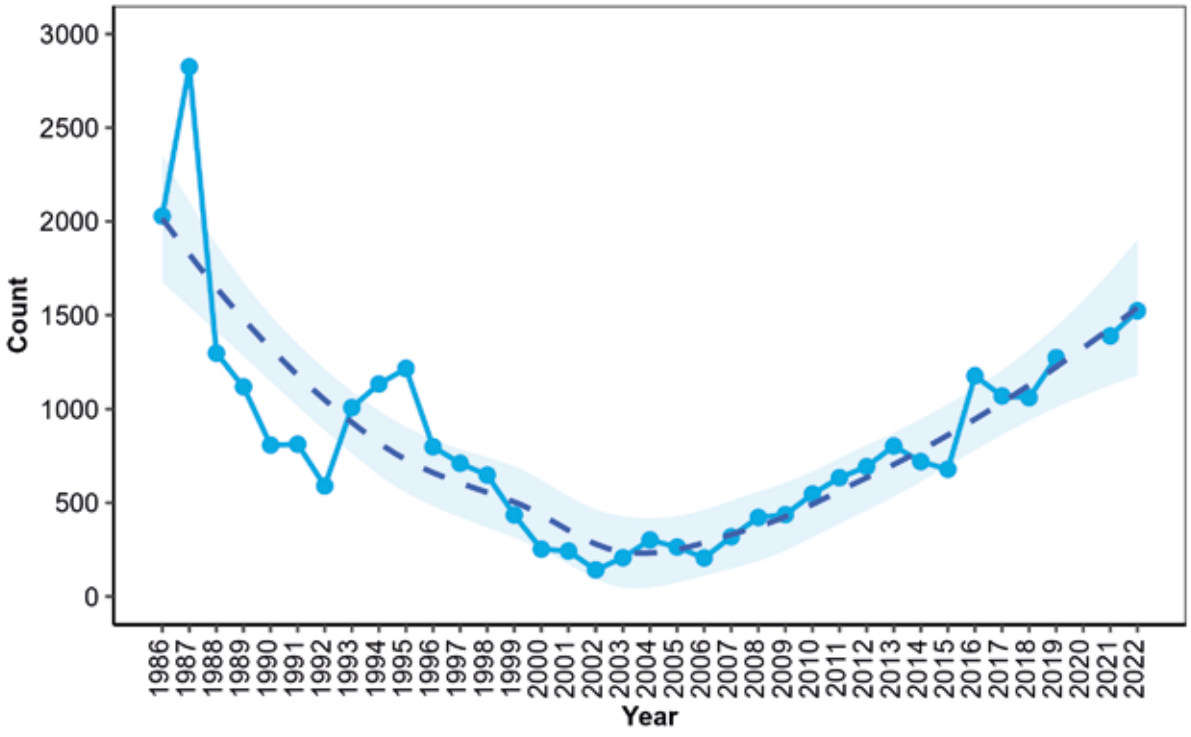
The other major colony spanning the three Copeland Islands has not been completely surveyed since 2012. However, in 2018, 2019, 2021 and 2022 volunteers from Copeland Bird Observatory conducted a full survey of Lighthouse Island, with 680 AON being estimated in 2022 (Table 6, Appendix). This is the highest count since the first estimate of 3,000 AOT made in 1985. Herring Gulls have not been counted regularly on Muck Island, but the past three years shows that the small population here has increased to 25 AON, although this is an 86% reduction on the highest count (184 AON) made on the island, back in 1995.

Coastal colonies on the north coast are less well recorded, but addressing part of this gap, the MarPAMM census of Rathlin found that Herring Gulls increased on the island by 493% to 83 AON since the 1998–2002 census, while between Runkerry and Murlough, they increased by 645% to 82 AOT/AON. A volunteer-led survey of The Skerries in 2020 revealed that it hosted an estimated 229 AON.

It is likely that urban-nesting Herring Gulls are on the rise around Northern Ireland, but little data exist outside of central Belfast. An NIEA-funded vantage-point survey from two of the tallest buildings in Belfast found that the very small population of eight AON recorded in the 1998–2002 census had increased to 39 in 2019 (Booth Jones *et al.* 2022). Due to the complexity of the roof-scape and the limited number of vantages, observed Herring Gull AONs are likely to be an underestimate of the total number present in central Belfast.

Small numbers have bred inland at Lower Lough Erne since records began in 2000, and only three were recorded in 2022 (Table 6, Appendix).

Figure 15: Herring Gull numbers (AON) at Strangford Lough, 1986–2022. No data were collected in 2020. The dashed line represents the Locally Weighted Least Squares Regression trend in Herring Gull numbers over time. The shaded region represents the 95% confidence interval around the trend.



Breeding success in 2022

No productivity data were collected for Herring Gull in 2022, but in 2021, RSPB monitored 12 AON in Carlingford Lough, which fledged six chicks (0.50 chicks/nest).

Great Black-backed Gull

Larus marinus

Conservation status: Green-listed in the BoCCI4 (2020–26), Amber-listed in the BoCC5 (2021), EC Birds Directive – migratory species, Least Concern – IUCN Red List (Europe).

KEVIN KIRKHAM

Overview

Synopsis: The Great Black-backed Gull is the largest of the gulls, with an average wing length of around 470 mm and average weight of 1.5 kg (BTO 2023). The species has an extensive breeding range across the north Atlantic. Great Black-backed Gulls are mostly found in open shore habitats during the breeding season (BTO 2023).

UK population size, abundance and breeding success trends: The Outer and Inner Hebrides and the Northern Isles of Scotland are the main strongholds for Great Black-backed Gulls in the UK and Ireland (JNCC 2021). During the 20th century their range and numbers grew on both sides of the Atlantic, rebounding from a period of decline that rendered the species virtually extinct as a breeder in Britain towards the end of the previous century (Mitchell *et al.* 2004). The UK population has been relatively stable across census periods, and at Seabird 2000 (1998–2002) it was estimated to be 16,735 AON. However, the UK abundance index was 14% below the 1986 baseline in 2019 (JNCC 2021) and the most recent population estimate is 15,000 (7,200–19,000) pairs (Mitchell *et al.* 2004; Woodward *et al.* 2020). During the winter, numbers of Great Black-backed Gulls increase to 77,000 (72,000–82,000) (Burton *et al.* 2013; Woodward *et al.* 2020).

There is no clear trend in the productivity of Great Black-backed Gulls, which has varied between 1.70 and 0.70 chicks per pair since 1986, but monitoring across the UK has shown that productivity has generally increased since the early 2000s (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: The population of Great Black-backed Gull in Northern Ireland declined by 74% from 240 AON to 71 AON between the 1969–70 and 1998–2002 censuses (JNCC 2021). However, the Northern Irish population appears to have more than doubled since the last census and numbers have also increased by 38% in the Republic of Ireland (JNCC 2021), resulting in a downgrading from Amber-listed to Green-listed in BoCCI4 (Gilbert *et al.* 2021). The most important site in Northern Ireland is on Great Minnis's Island, Strangford Lough. The second most important colony is probably now at Burial Island, Outer Ards peninsula. Although this colony has not been completely surveyed since 1998 (when no birds were present), a population has again established itself on the island (Kerry Leonard, pers. comm.). Approximately 1,000 Great Black-backed Gulls occur in Northern Ireland during the winter (Burton *et al.* 2013; Woodward *et al.* 2020).

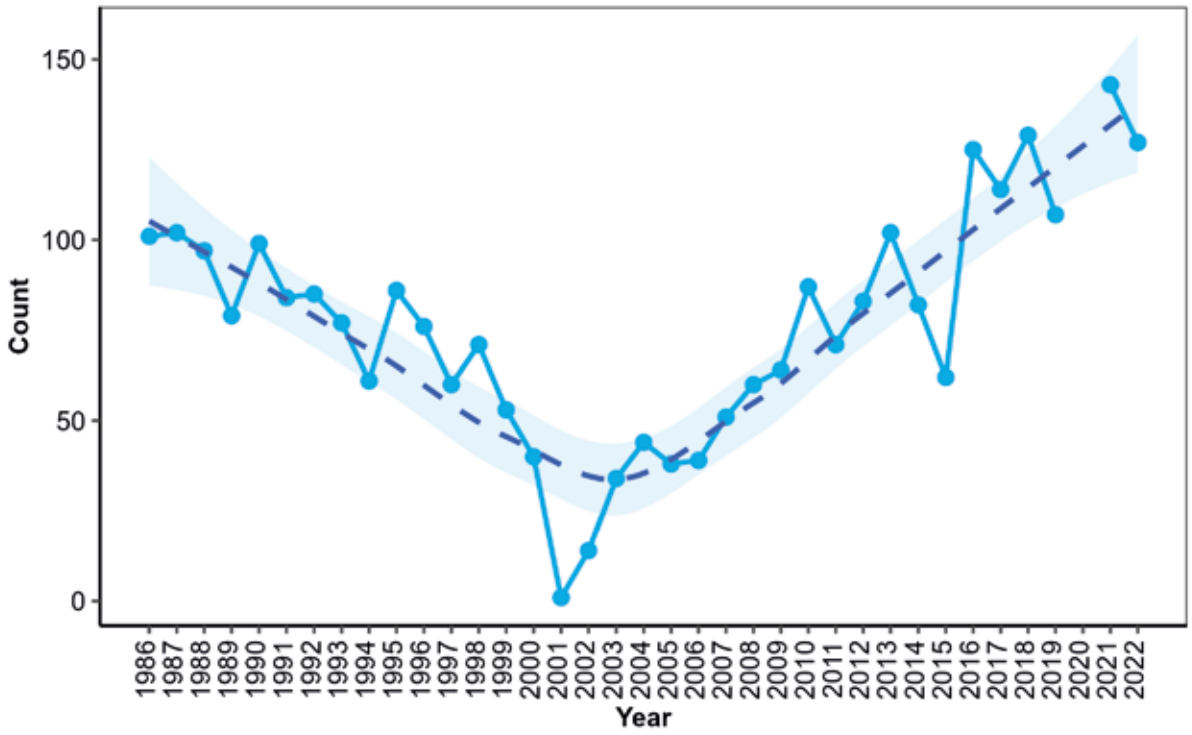
The collection of productivity data in Northern Ireland has been limited; therefore productivity estimates cannot be modelled at the regional-level (JNCC 2021).

Abundance in 2022

The biggest colony of Great Black-backed Gulls occurs on Strangford Lough, and the largest count of since 1972 was made in 2021, with 143 AON recorded. However, numbers fell a little this year to 127 AON (Figure 16). A breakdown of counts across different islands can be found in the Strangford report on page 79. Numbers had declined to more typical levels on Muck Island in 2022, where four AON were recorded, after a record high of 11 AON in 2021 (Table 6, Appendix). Very few Great Black-backed Gulls were recorded elsewhere in Northern Ireland this year, although two AON were counted between Maggy's Leap and Newcastle, while inland at Lough Neagh, five IND were observed and there were two IND at Lower Lough Erne.

The MarPAMM census of Rathlin in 2021 found that Great Black-backed Gulls had increased on the island by 300% to 12 AON since the 1998–2002 census, while between Runkerry and Murlough, they increased by 17% to seven AOT/AON (Booth Jones *et al.* 2022).

Figure 16: Great Black-backed Gull counts (AON) at Strangford Lough, 1986–2022. No data were collected in 2020. The dashed line represents the Locally Weighted Least Squares Regression trend in Great Black-backed Gull numbers over time. The shaded region represents the 95% confidence interval around the trend.



Breeding success in 2022

No nests of Great Black-backed Gull were monitored in Northern Ireland in 2022.

Little Tern

Sternula albifrons

Conservation status: Amber-listed in the BoCCI4 (2020–26), Amber-listed in the BoCC5 (2021), EC Birds Directive – listed in Annex 1 and as a migratory species, Least Concern – IUCN Red List (Europe), Northern Ireland Priority species (Northern Ireland Biodiversity Strategy 2002).

PHILIP CROFT / BTO

Overview

Synopsis: Little Terns are the UK's smallest breeding tern species. They are exclusively coastal, usually nesting on beaches where their eggs are so well camouflaged they are almost invisible.

UK population size, abundance and breeding success trends: Numbers of Little Tern in the UK declined (-23%) between the 1985–88 census and the most recent census (1998–2002). Although the population of 1,927 AON was higher during Seabird 2000 than during the original census of 1969–70 (JNCC 2021), recent estimates suggest the population size has reduced to 1,418 pairs (Eaton *et al*. 2020).

The breeding success of Little Terns varies greatly from year to year. At the UK level, breeding success was 0.56 chicks per pair in 2019 (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: Little Terns are a rare breeding species on the island of Ireland (Burke *et al.* 2020), with main breeding concentrations on the east coast. In Northern Ireland they have always been an infrequent breeding species and have not been reported as definitely nesting since 1996.

Abundance in 2022

No breeding attempts were reported in 2022, although two IND were observed at Bird Island (Portavogie) during the breeding season. It is possible that these were failed breeders from the Point of Aird colony on the Isle of Man (Hugh Thurgate, National Trust, pers. comm.).

Sandwich Tern

Thalasseus sandvicensis

Conservation status: Amber-listed in the BoCCI4 (2020–26), Amber-listed in the BoCC5 (2021), EC Birds Directive – Annex 1 and migratory species, Least Concern – IUCN Red List (Europe).

TOM CADWALLENDER / BTO

Overview

Synopsis: The Sandwich Tern is the largest species of tern breeding in Northern Ireland. It is known for its extremely variable population trends and distribution, caused by the tendency for large numbers of individuals to move between colonies (JNCC 2021). Sandwich Terns almost always nest in shared colonies with Black-headed Gulls, potentially benefitting from the gulls' aggressive nest defence in response to predators (Smith 1975).

UK population size, abundance and breeding success trends: The UK holds approximately 10% of the world population of Sandwich Terns (JNCC 2021). Census data indicate that the UK population increased by 33% between the 1969–70 and 1985–88 censuses, but that numbers then declined by 15% by 1998–2002 (JNCC 2021). Annual SMP data indicate that current numbers are similar to the 1986 baseline, and the most recent population estimate is 14,000 (13,000–15,000) pairs (JNCC 2021; Woodward *et al.* 2020).

UK productivity averaged 0.66 between 1986 and 2008 (JNCC 2020), but averaged 0.41 chicks per pair in 2019 (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: During Seabird 2000 (1998–2002), the population size of Sandwich Tern in Northern Ireland was 1,954 AON, an 11% decline since the previous census. The most recent estimate puts the Northern Ireland population at around 1,500 pairs (Mitchell *et al.* 2004; Woodward *et al.* 2020). In Northern Ireland most Sandwich Terns breed in a few large colonies at Strangford Lough, Larne Lough, Lower Lough Erne and Cockle Island, Groomsport. Sandwich Tern has the most complete and consistent monitoring record over the longest period and of any seabird species in Northern Ireland.

The collection of productivity data in Northern Ireland has been limited, but between 1990 and 2019 the mean breeding success was 0.31 chicks per pair per year (JNCC 2021).

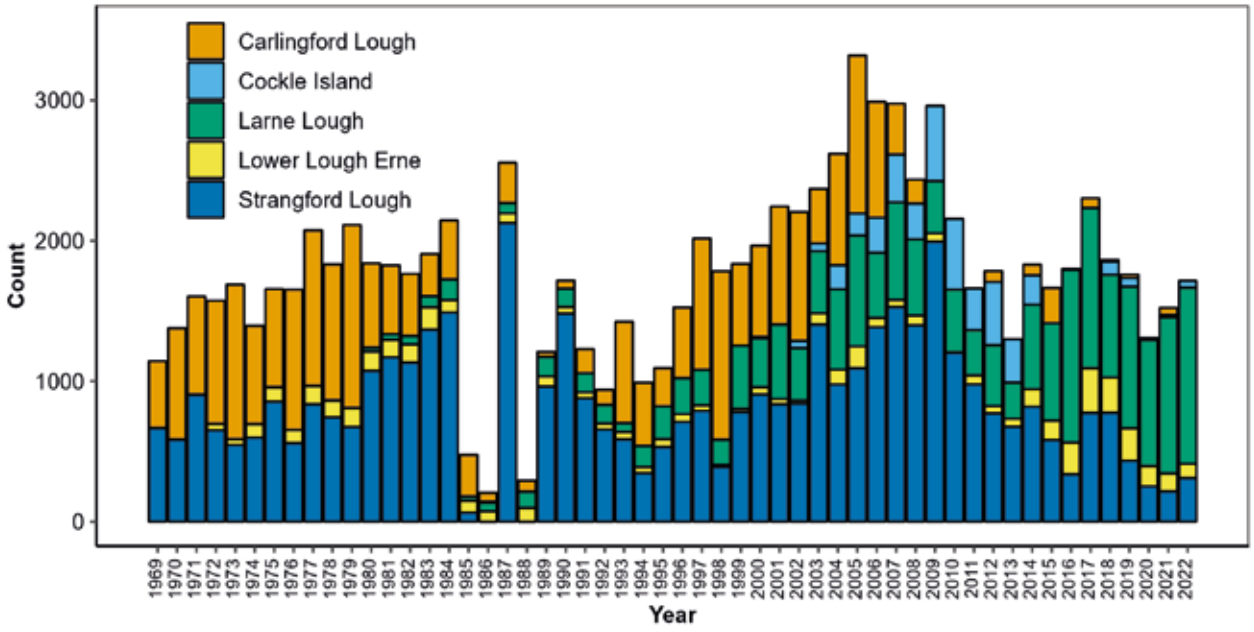
Abundance in 2022

Presenting the total populations for the main coastal colonies together (Figure 17) is advantageous as terns may move colony from year to year and it allows an overall appraisal of the Northern Ireland population.

The count of Sandwich Terns at Strangford Lough is the longest running population count of seabirds in Northern Ireland, and celebrated its 50th year in 2018 (Hugh Thurgate, pers. comm.). This year they fared slightly better in terms of breeding abundance than the previous two years, at 310 AON (see page 79 for Strangford Lough nesting report), while increases were also evident on Cockle Island, Outer Ards, where 48 AON were counted, a 243% increase on 2021. The largest colony of Sandwich Terns in Northern Ireland currently nests in Larne Lough, where 1,254 AON were counted in 2022, which is the highest count since records began in 1975. Numbers of Sandwich Terns have been very small in Carlingford Lough in recent years (Table 6, Appendix), and while 52 AON were recorded in 2021, none bred here in 2022.

Sandwich Terns can also be found inland at Lower Lough Erne where 102 AON were counted in 2022, continuing a decline from a peak in 2017 of 316 AON.

Figure 17: Cumulative Sandwich Tern counts (AON) at Carlingford Lough, Cockle Island, Larne Lough, Lower Lough Erne and Strangford Lough, 1969–2022. Sandwich Terns were not counted in Carlingford Lough and were an estimate at Larne Lough in 2020. The total bar height represents the number of Sandwich Tern pairs per year, and the colour represents the number in each site.

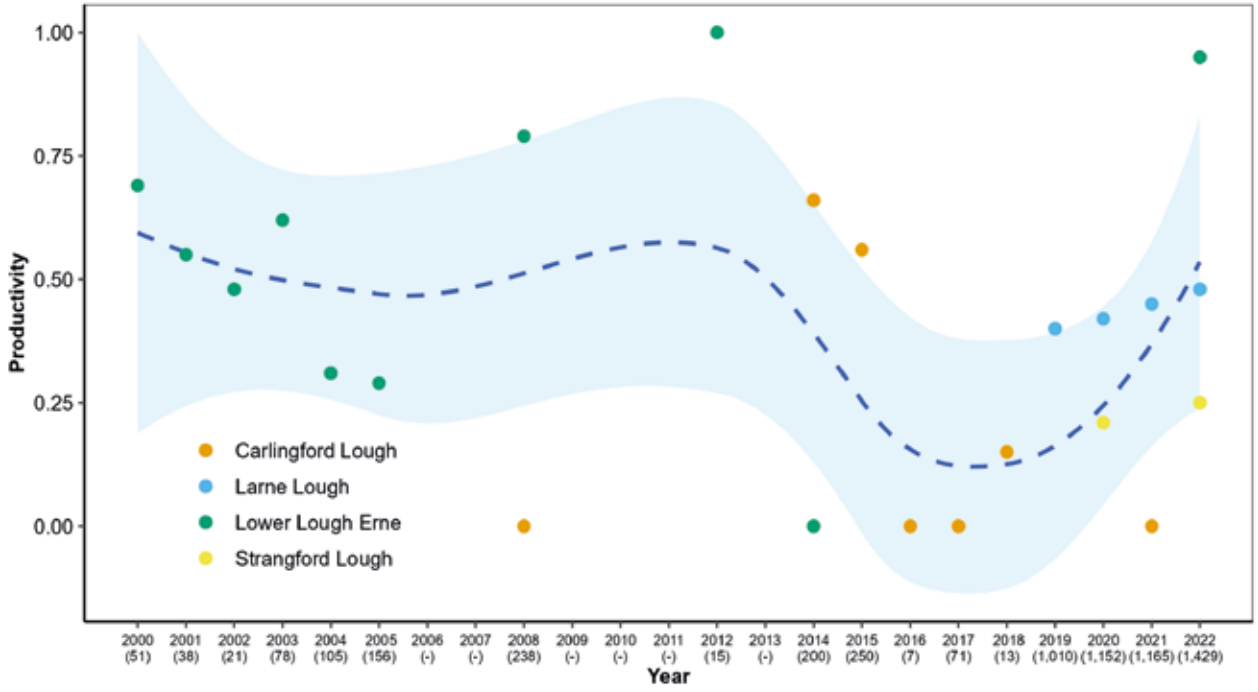


Breeding success in 2022

Sandwich Tern productivity has been measured intermittently at four colonies: Lower Lough Erne (RSPB), Carlingford Lough (RSPB), Larne Lough (RSPB), and Strangford Lough (National Trust) (Figure 18). Over this time period and across all loughs productivity ranged from 0 to 1 chicks/AON, and was on average 0.40 (95% CI: 0.27–0.53).

In 2022, breeding success appeared to be highest in Lower Lough Erne at 0.95 chicks/AON; however, this figure was gained from limited visits. Breeding success Larne Lough and Strangford Lough was low (0.48 and 0.25 chicks/AON, respectively). More details on the Strangford Sandwich Terns can be found on pages 78 and 79. No Sandwich Terns bred at Carlingford Lough this year. Despite improving breeding success at Carlingford Lough from 2011–15 due to an intensified programme of monitoring and conservation, productivity has been consistently low in recent years, caused by the suspected predation of eggs and young by Otter (Matthew Tickner, RSPB, pers. comm).

Figure 18: Sandwich Tern productivity (chicks/AON) 2000–22 across four sites in Northern Ireland (Lower Lough Erne, Carlingford Lough, Larne Lough, and Strangford Lough). No data were available for 2006, 2007, 2009–11, 2013. The dashed line represents the Locally Weighted Least Squares Regression trend in productivity over time. The shaded region represents the 95% confidence interval around the trend. The total number of AON monitored per year is included in brackets under the year, with unknown numbers denoted by a hyphen (-).



Common Tern

Sterna hirundo

Conservation status: Amber-listed in the BoCCI4 (2020–26), Amber-listed in the BoCC5 (2021), EC Birds Directive – listed in Annex 1 and as a migratory species, Least Concern – IUCN Red List (Europe).

EDMUND FELLOWES / BTO

Overview

Synopsis: Despite the name, Common Tern is not the most abundant UK tern species, but it is probably the most familiar because its breeding range extends around much of the coastline and inland to lakes and loughs across most of the UK (JNCC 2021).

UK population size, abundance and breeding success trends: Although the UK population rose slightly between the 1969–70 and 1985–88 censuses, numbers fell to 11,838 AON by Seabird 2000 (1998–2002), a similar number as recorded in the first census (JNCC 2021). Analysis of annual SMP data indicates that the population has decreased by 10% between 1986 and 2019 (JNCC 2021) and the latest UK population estimate is 11,000 AON (Mitchell *et al.* 2004; Woodward *et al.* 2020).

Productivity fluctuates between years as it is heavily influenced by weather conditions, predation and foraging success. Between 1986 and 2019, UK breeding success varied between approximately 0.30 and 0.80 chicks per pair per year and in 2019 averaged 0.45 chicks per pair per year (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: Common Tern is the most widespread breeding tern species in Northern Ireland, with both coastal and inland populations. Historical data for the main Northern Ireland colonies are incomplete. In the late 1980s, there was a sudden increase in Common Terns to over 1,000 AON and, by the early 21st century, there were over 2,000 AON. Since this peak the population has again declined and the most recent estimate is around 1,400 AON (Mitchell *et al.* 2004; Woodward *et al.* 2020). Significant numbers breed at several sites on Lough Neagh but these are patchily monitored. The main coastal sites are Strangford Lough, Larne Lough, Belfast Lough and Carlingford Lough.

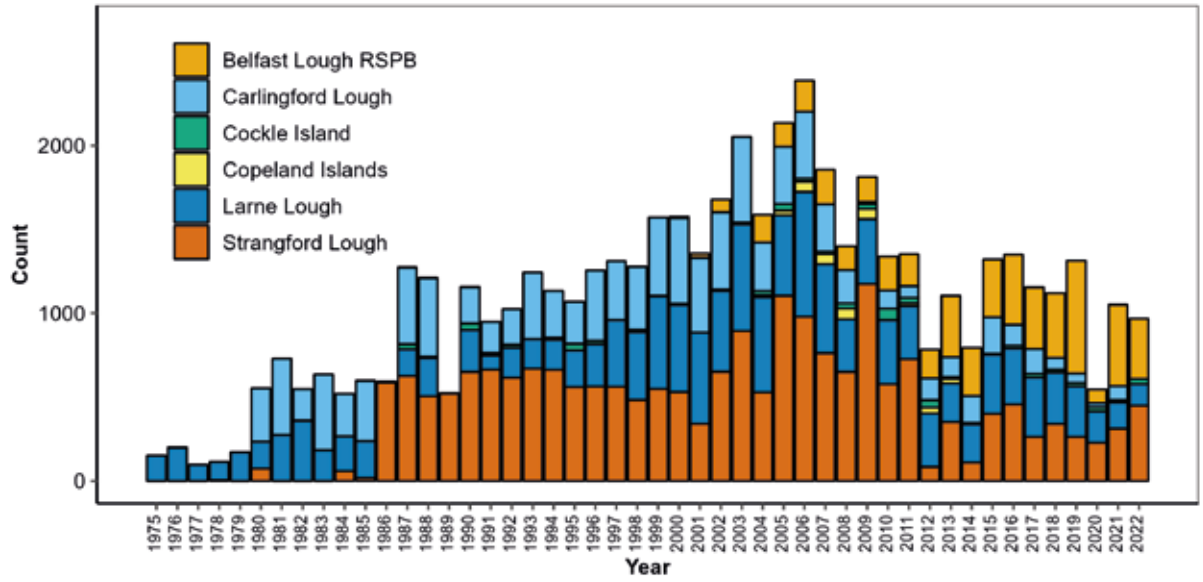
Productivity data for Common Terns in Northern Ireland show they had an average fledging rate of 0.65 chicks per pair per year between 1999 and 2019 (JNCC 2021).

Abundance in 2021

Numbers of Common Terns appear to have recovered after a bad year in 2020, when the total coastal Northern Irish population (including Belfast Lough RSPB, Carlingford Lough, Cockle Island, Larne Lough and Strangford Lough) more than halved from 2019 levels due to losses at Larne and Belfast Loughs (Figure 19, Table 6, Appendix). This decline was thought to be genuine rather than due to the impact of COVID-19 restrictions on surveys since tern monitoring was not affected. Total numbers (1,097 AON) were very similar to 2021 (1,077 AON), with a 44% increase at Strangford Lough, a 26% decrease at Belfast Lough, and other smaller coastal colonies remaining relatively stable (Table 6, Appendix). Terns at Carlingford Lough (96 AON) were counted as 'Commic', i.e. not discerned to species level between Common and Arctic, and therefore are not included in Figure 19.

Common Terns can also be found breeding inland, and in 2022 34 AON were recorded at Portmore Lough RSPB reserve. In addition to this, an average flush count of 175 IND was recorded by the Lough Neagh Partnership around the lough externally to the reserve, where counting nests is more challenging. At Lower Lough Erne, 33 AON were recorded in 2022.

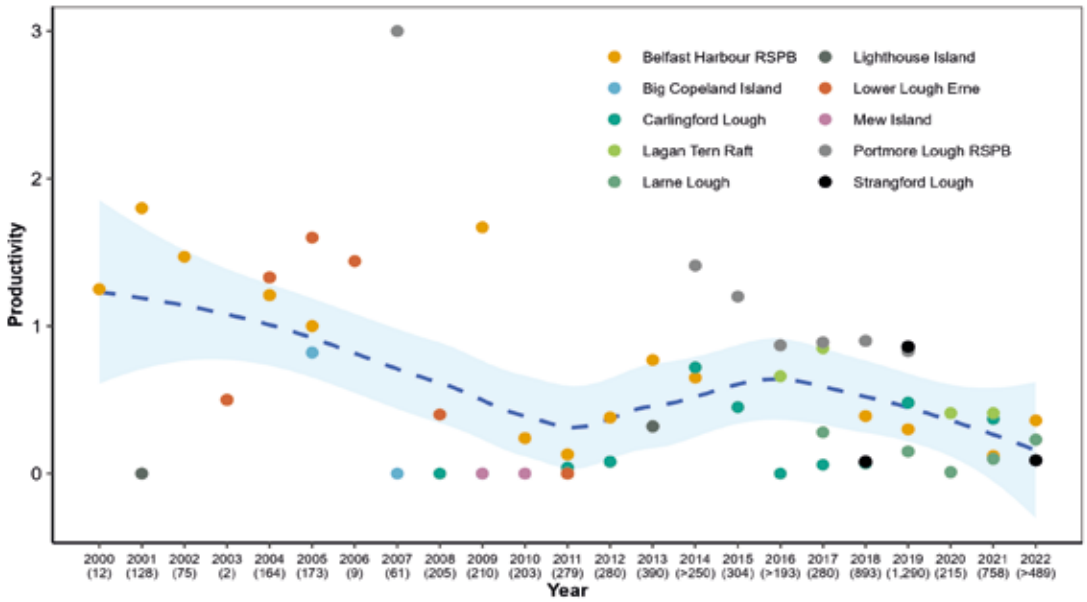
Figure 19: Cumulative Common Tern numbers (AON) at the coastal colonies of Belfast Lough RSPB, Carlingford Lough (count of 'Commic' terns not included for 2022), Cockle Island, the Copeland Islands (not counted since 2013), Larne Lough and Strangford Lough, 1975–2022. The total bar height represents the number of Common Tern pairs per year, and the colour represents the number in each site.



Breeding success in 2022

While not all are surveyed every year, 10 sites have received some monitoring effort since 1999, and the overall picture is of a low and declining breeding success (Figure 20). Three sites were monitored for breeding success in 2022, with an average of 0.23 chicks/AON (95% CI: -0.11–0.56), which was similar overall to 2021 (0.28 chicks/AON) but lower than the average between 2000 and 2022 across all sites (0.58 chicks/AON, 95% CI: 0.42–0.74). Colonies at Larne Lough and Belfast Lough RSPB continued to have a low productivity, at only 0.23 and 0.36 chicks/AON respectively (RSPB). Eight colonies were monitored in Strangford Lough in 2022 with a very low productivity of 0.09, due to a combination of exposure to flooding and predation by Mink (see page 79 for the Strangford Lough Seabird Monitoring Report, National Trust). Difficulties viewing the rafts without causing disturbance made monitoring breeding success impossible this year at Portmore Lough, but this colony had the highest breeding success of 2021, at 0.80 chicks/AON (RSPB).

Figure 20: Common Tern productivity (chicks/AON) 2000–22 across 10 sites in Northern Ireland (Belfast Harbour RSPB, Big Copeland Island, Carlingford Lough, Lagan Tern Raft, Larne Lough, Lighthouse Island, Lower Lough Erne, Mew Island, Portmore Lough RSPB and Strangford Lough). The dashed line represents the Locally Weighted Least Squares Regression trend in productivity over time. The shaded region represents the 95% confidence interval around the trend. The total number of AON monitored per year is included in brackets under the year.



Roseate Tern

Sterna dougallii

Conservation status: Amber-listed in the BoCCI4 (2020–26), Red-listed in the BoCC5 (2021), EC Birds Directive – listed in Annex 1 and as a migratory species, Least Concern – IUCN Red List (Europe), Northern Ireland Priority species (Northern Ireland Biodiversity Strategy 2002).

TOM CADWALLENDER / BTO

Overview

Synopsis: Roseate Terns are whiter than Common Terns and sometimes have a pinkish tinge, likely obtained from the carotenoid astaxanthin found in their diet (Hays *et al.* 2006). Roseate Terns were nearly hunted to extinction for the millenary trade in the 19th century; although they did recover in numbers during the 20th century, they are now the most range-restricted tern species in the UK with breeding occurring at only a few colonies (JNCC 2021).

UK population size, abundance and breeding success trends: In the Seabird 2000 (1998–2002) census only 56 AON were recorded, a decline of 83% from the previous census. However, the population is now showing some early signs of recovery and in 2018 there were 120 AON (Eaton *et al.* 2020). In Scotland, the main colony at the Firth of Forth appears to have been largely extirpated, partly due to competition for nesting sites with gulls, and now only single pairs appear in mixed tern colonies in Scotland (JNCC 2021). The only colony in England, on Coquet Island, has had greater success, increasing during the last decade from under 40 AON to over 100 AON (JNCC 2021). It may have benefitted from emigration from other sites, as well as the provision of nest sites and protection from predators (JNCC 2021). Declines in Roseate Terns in Wales may have been due to emigration to more suitable breeding sites in the Republic of Ireland, and only a single pair were recorded to have nested in 2018 (Eaton *et al.* 2020). The stronghold for the species is now in the east of the Republic of Ireland at Rockabill Island and Lady's Island Lake.

The breeding success of Roseate Terns in UK colonies has been moderate to high, probably due to increased conservation efforts. Since 2000, productivity has varied between approximately 0.40 and 0.80 chicks per pair per year (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: Historically Mew Island in the Copeland Group was one of the major sites for Roseate Tern in Ireland (Thompson, 1851). However, the species ceased to breed in Northern Ireland around 1880 before apparently re-colonising in the first quarter of the 20th century (Deane 1954) and good numbers were again breeding on Mew by 1941 (Williamson *et al.* 1941) before rapidly decreasing to extinction on the island in the 1950s. Carlingford Lough formerly held a population of up to 40 AON in 1987. Numbers of Roseate Terns were also highest in the late 1980s in Larne Lough but have clung on as a breeding species there since, albeit in very small numbers. Between the 1985–88 and the 1998–2002 censuses, the number of Roseate Terns in Northern Ireland declined by 94% from 62 to four AON.

Although only a single pair of Roseate Terns has nested in Northern Ireland in recent years. The species productivity in Northern Ireland between 1991 and 2019 was 0.68 chicks fledged per pair per year (JNCC 2021).

Abundance in 2022

In 2022, there was again a single pair at Larne Lough (Table 6, Appendix).

Breeding success in 2022

The pair at Larne Lough fledged one chick in 2022 (RSPB).

Arctic Tern

Sterna paradisaea

Conservation status: Amber-listed in the BoCCI4 (2020–26), Amber-listed in the BoCC5 (2021), EC Birds Directive – listed in Annex 1 and as a migratory species, Least Concern – IUCN Red List (Europe).

LIZ CUTTING / BTO

Overview

Synopsis: Similar in appearance to the Common Tern, but with a longer tail and without any black on the beak, the Arctic Tern is the commonest tern species in the UK. However, due to its more northerly distribution, it is less familiar to many than the Common Tern (JNCC 2021).

UK population size, abundance and breeding success trends: The UK population has fluctuated greatly since the 1960s. There was an apparent 50% increase in numbers between the 1969–70 and 1985–88 censuses, though there is uncertainty as to the true magnitude of this change due to questions of compatibility of methods between censuses. At the last census, the population was estimated to be 53,380 AON, a decrease of 31% since 1985–1988 (Mitchell *et al.* 2004). Annual SMP data indicate that current numbers are similar to the 1986 baseline (JNCC 2021). Arctic Terns suffer the lowest breeding success of any seabird species in the UK, remaining below 0.30 chicks per pair in most years, potentially linked to prey shortages, extreme weather, and predation (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: In Northern Ireland the species is concentrated into just a few colonies including the Copeland Islands, Strangford Lough, Belfast Harbour, Bird Island, Green Island and Cockle Island. The population grew in the intervals between the previous censuses, rising by 257% between 1969–70 and 1985–88, and again by 78% to 767 AON by Seabird 2000 (1998–2002, JNCC 2021). Since the last census, Arctic Tern numbers peaked in 2006 at 1,854 AON, which included counts of all major colonies.

Between 1991 and 2019, Arctic Tern breeding success in Northern Ireland was similar to that elsewhere in the UK, producing an average of 0.30 chicks per pair per year (JNCC 2021).

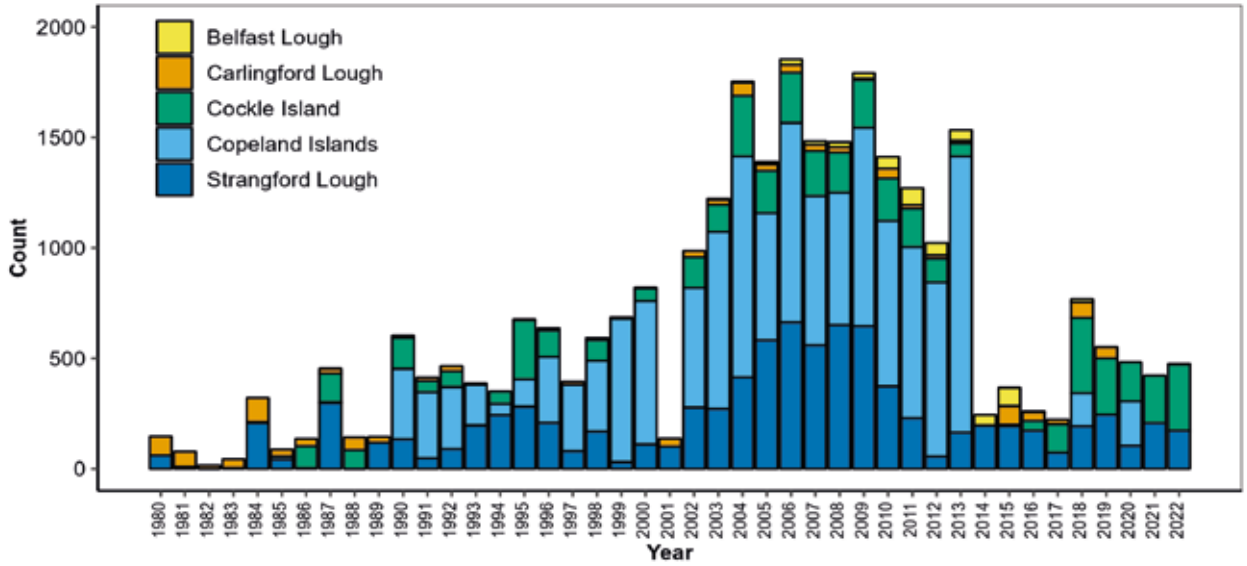
Abundance in 2022

Colonies of Arctic Terns around Northern Ireland are highly variable in their size year-to-year (Figure 21). In the last 25 years, the Copeland Islands and Strangford Lough have held the majority of breeding Arctic Terns in Northern Ireland. The colony at the Copeland Islands fluctuated between 600 and 1,250 AON between 2000 and 2013, but no full survey has taken place on all three islands since 2013 and it is thought that the breeding terns of the islands have largely moved elsewhere. During rare access to Big Copeland, approximately 200 Arctic Tern AON were estimated to be present in 2020 (Gareth Platt, pers. comm.), more than the estimate for the previous year (75 AON, Table 6, Appendix). In 2019, 150 individuals were present on Lighthouse Island, Copelands, and these experienced a complete breeding failure potentially due to high levels of predation from Jackdaws *Corvus monedula* (Chris Acheson and David Galbraith, Copeland Bird Observatory, pers. comm.). No Arctic Terns nested on Lighthouse Island in 2021 (Katherine Booth Jones, Copeland Bird Observatory, pers. obs.).

Numbers present at Strangford Lough have declined in the past decade, falling from a high of 663 AON in 2006 (Figure 21). Numbers on the eight Strangford Lough island colonies declined further in 2022 to 173 AON (Table 6, Appendix). Although numbers of Arctic Terns were between 48 and 83 AON in Belfast Lough RSPB between 2010 and 2015, they have been much scarcer since, with no breeding pairs in 2020 or 2021 and three AON in 2022 (Table 6, Appendix). The Cockle Island, Outer Ards population has been particularly variable, but also increased for the second year running in 2022 to 299 AON. Arctic Terns were not fully counted at

Carlingford Lough in 2022, with records of 'Commic' terns made, i.e. not discerned to species level between Common and Arctic, and therefore these are not included in Figure 21.

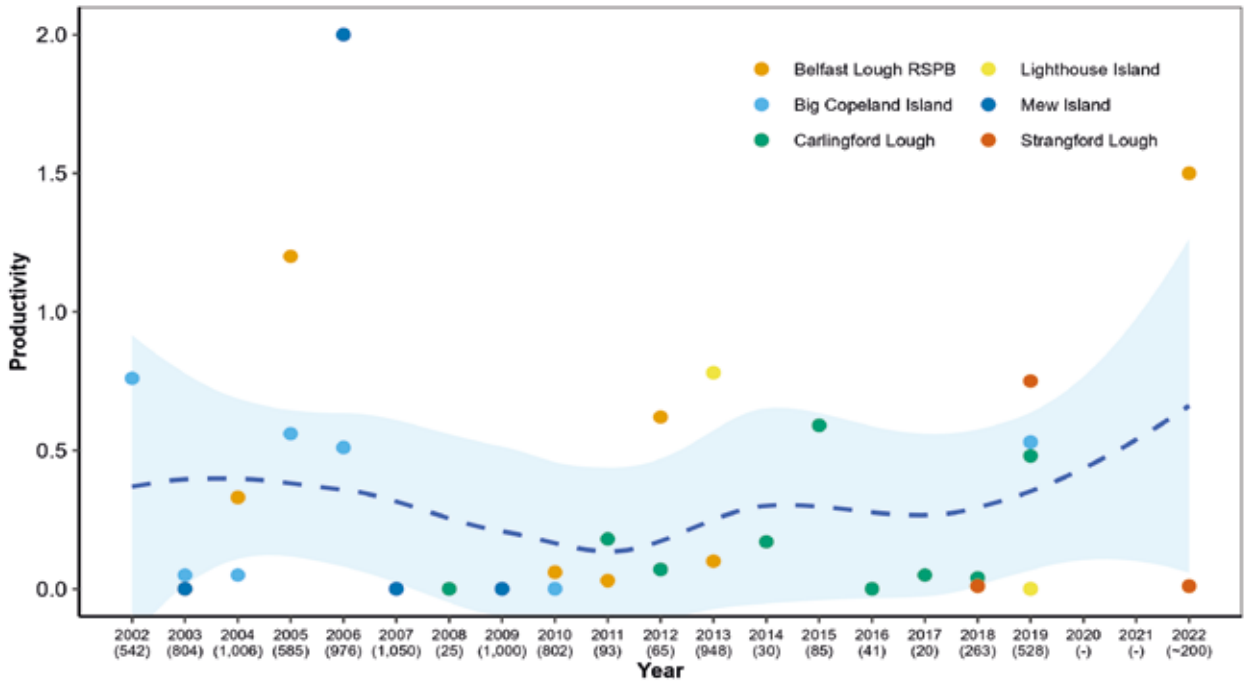
Figure 21: Cumulative Arctic Tern counts (AON) at Belfast Lough RSPB, Carlingford Lough, Cockle Island, The Copeland Islands and Strangford Lough 1980–2022. Arctic Terns were not counted at Carlingford Lough in 2020 or 2021, and counts of 'Commic' terns in 2022 were also not included. The Copeland Islands consist of a group of three islands that have not been fully surveyed since 2013 and contain estimated numbers. The area filled represents the number of Arctic Tern pairs per year, and the colour represents the number in each site.



Breeding success in 2022

Eight sites have received some productivity monitoring effort since 1990, but few of these are regularly monitored. The last productivity data available for Larne Lough were collected in 1990 (zero fledged from four AON) and from Cockle Island in 1996 (50 fledged from 120 AON). In 2022, only Strangford Lough and the Belfast Lough RSPB reserve were monitored for productivity. Only two AON (out of a total of three AON) were followed in the Belfast Lough reserve, the productivity figure for these being 1.50 chicks/AON (three chicks fledged). Monitoring of Arctic Tern in Strangford Lough by National Trust found a near-complete breeding failure (for more information, see the Strangford Lough Seabird Monitoring Report, page 79), with only approximately 0.01 chicks/AON. Overall, average breeding productivity of Arctic Tern in Northern Ireland since 1990 is 0.33 chicks/AON (95% CI: 0.18–0.48).

Figure 22: Arctic Tern productivity (chicks/AON) 2002–22 across six sites in Northern Ireland (Belfast Harbour RSPB, Big Copeland Island, Carlingford Lough, Lighthouse Island, Mew Island, and Strangford Lough). No data were available for 2020 and 2021. The dashed line represents the Locally Weighted Least Squares Regression trend in productivity over time. The shaded region represents the 95% confidence interval around the trend. The total number of AON monitored per year is included in brackets under the year, with unknown numbers denoted by a hyphen (-).



Guillemot

Uria aalge

Conservation status: Amber-listed in BoCCI4 (2020–26), Amber-listed in the BoCC5 (2021), EC Birds Directive – migratory species, Least Concern – IUCN Red List (Europe).

KEITH KIRKHAM

Overview

Synopsis: The Guillemot is one of the most abundant seabirds in the northern hemisphere (JNCC 2021). Guillemots are extremely gregarious and colonies can contain many tens of thousands of individuals, and these very large populations occur both in the Atlantic and Pacific Oceans (JNCC 2021).

UK population size, abundance and breeding success trends: The UK and Ireland censuses in 2000 showed a large population increase compared to the previous survey, although some of this may have been due to better coverage and survey methods (JNCC 2021). Between the 1969–70 and 1998–2002 censuses, the numbers of individuals recorded rose from 611,281 to 1,416,334. The most recent estimates put the population size at approximately 950,000 individuals (Mitchell *et al.* 2004; Woodward *et a*l. 2020). Annual SMP data indicate that numbers in 2019 were 86% above the 1986 baseline, although it was noted that that figure should be treated with caution as the large number of smaller colonies included in the sample were likely to have had a disproportionate influence on the index (JNCC 2021).

The average breeding success of Guillemots in the UK between 1986 and 2002 was approximately 0.70 chicks per pair, but subsequently declined steeply until 2007. Recent years have seen a recovery in breeding success and in 2019, productivity was 0.62 chicks fledged per pair (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: In Northern Ireland the main colony is on Rathlin Island with smaller satellites at The Gobbins, Muck Island and at scattered cliff faces between Ballycastle and Portrush. Between the 1969–70 and 1985–88 censuses, the numbers of Guillemot appeared to remain stable, but had more than doubled to 98,546 individuals by Seabird 2000 (JNCC 2021). Following a 50% decrease between 1999 and 2007, numbers of Guillemots rose by 60% to 130,445 individuals in 2011, when the last full survey was undertaken of Rathlin (Allen *et al.* 2011). This made Rathlin the largest colony in the UK and Ireland.

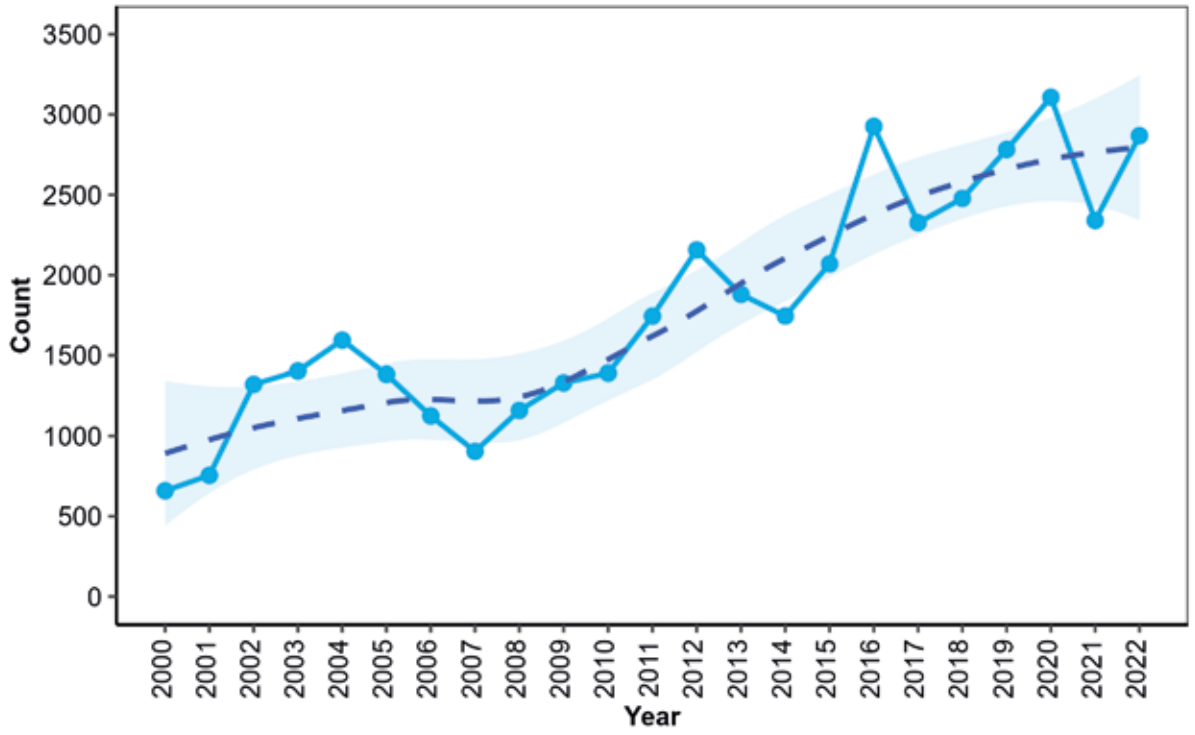
The collection of productivity data in Northern Ireland has been limited; therefore productivity estimates cannot be modelled at the regional-level (JNCC 2021).

Abundance in 2022

Only two sites were monitored for Guillemot in 2022: Muck Island and Rathlin Island RSPB reserve. Numbers of Guillemot at Muck Island, which has received continuous monitoring for this species since 2000, increased by 23% between 2021 and 2022 to 2,868 IND. This colony has had a generally positive trend in numbers since 2000, reaching a peak of 3,107 IND in 2020 (Figure 23). While no surveying was carried out on The Gobbins in 2020 or 2021, in past years the trend at this neighbouring site has generally matched that seen on Muck Island (Table 6, Appendix).

On Rathlin Island, the RSPB carry out annual comparative counts of study plots to monitor population levels. While no data were available for 2019 or 2020, in 2022 only 286 IND Guillemots were counted in the north cliffs study plot, compared to 592 IND in the plot in 2018. A full census of Rathlin Island was carried out for MarPAMM in 2021 and found a total of 149,510 IND, which was an increase of 56% on the census of 1998-2002. Likewise, along the north Antrim coast between Runkerry and Murlough, Guillemots increased by 57% to 981 IND in 2021 since the last census (Booth Jones *et al.* 2022).

Figure 23: Guillemot counts (individuals) at Muck Island, 2000–22. The dashed line represents the Locally Weighted Least Squares Regression trend in Guillemot numbers over time at Muck Island. The shaded region represents the 95% confidence interval around the trend.



Breeding success in 2022

No breeding success data have been collected for Guillemot since 2019, when a sample of 29 nests (not a formal Seabird Monitoring Programme plot) was monitored on Rathlin Island near the West Light, producing 19 jumplings (0.66 chicks/AON) (Else & Watson 2019).

Razorbill

Alca torda

Conservation status: Red-listed in the BoCCI4 (2020–26), Amber-listed in the BoCC5 (2021), EC Birds Directive – migratory species, Least Concern – IUCN Red List (Europe).

LIZ CUTTING / BTO

Overview

Synopsis: The Razorbill is an auk of the North Atlantic and Arctic Ocean, breeding on both sides of the Atlantic. Razorbills nest on ledges with Guillemots and Kittiwakes, but also frequently in clefts, holes and under boulders.

UK population size, abundance and breeding success trends: Razorbill populations showed successive increases between the national censuses, though the population of 132,734 individuals recorded at the time of the first census in 1969–70 may have been underestimated because the small ledges they nest on can often be hidden from view, making them difficult to count (JNCC 2021; Mitchell *et al.* 2004). By Seabird 2000 (1998–2002), the estimated population size was 187,052 individuals, a 21% increase on the previous 1985–88 census. The latest estimates put the population size at approximately 165,000 (100,000–250,000) individuals (Mitchell *et al.* 2004; Woodward *et al.* 2020). The UK breeding abundance index was 195% above the 1986 baseline in 2019, although wide confidence intervals mean this apparent increase should be treated with caution (JNCC 2021).

Productivity was stable from 1986 to 2001 but declined to 0.38 chick/pair in 2008. Productivity has increased since and an average of 0.63 Razorbill chicks were fledged per pair in 2019 (Miles *et al.* 2015).

Northern Ireland population size, abundance and breeding success trends: Between the 1969–70 and 1985–88 censuses, the numbers of Razorbills increased by 58%, and had more than doubled to 24,084 individuals by Seabird 2000 (JNCC 2021). In Northern Ireland the main colony is on Rathlin Island with smaller satellites at The Gobbins, Muck Island and at scattered cliff faces between Ballycastle and Portrush. The last full survey of Rathlin, in 2011, recorded 22,975 individuals (Allen *et al.* 2011), when it was the second largest colony of Razorbills in the UK at the time (JNCC 2021). Razorbills were upgraded from Amber-listed to Red-listed in BoCCI4 due to their increased European status (Gilbert *et al.* 2021).

The collection of productivity data in Northern Ireland has been limited; therefore productivity estimates cannot be modelled at the regional-level (JNCC 2021).

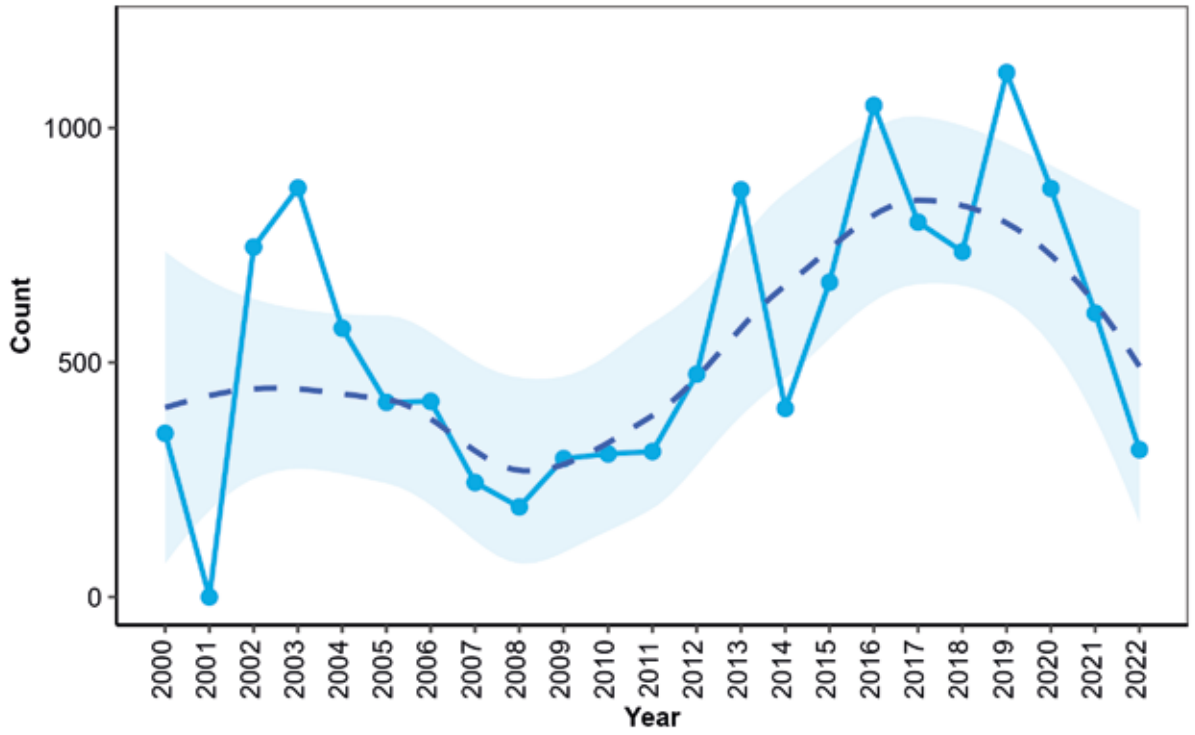
Abundance in 2022

Razorbills were only monitored at two sites in 2022: Rathlin Island RSPB reserve and Muck Island (Table 6, Appendix).

The number of Razorbills was at the highest level ever recorded on Muck Island in 2019 at 1,118 IND, but since then numbers have fallen, with those in 2022, 314 IND, their lowest since 2009 (Figure 24). However, it should be noted that numbers of Razorbills in attendance at the colony can be subject to large fluctuations, as in some years, many birds may not breed. Numbers at the neighbouring colony at The Gobbins decreased by 23% between 2018 and 2019, to 679 IND (Table 6, Appendix), but no counts have been carried out since.

In 2022, 130 Razorbills were recorded in the Rathlin Island RSPB reserve's north cliffs study plot (Table 6, Appendix). A full census of Rathlin Island and of the north Antrim coastline between Runkerry and Murlough occurred as part of the MarPAMM project in 2021 (Booth Jones *et al.* 2022). These surveys found that Razorbills increased very slightly (by 7%) on Rathlin to 22,421 IND since the 1998–2002 census, but in contrast on the north coast stretch they declined by 70% to 582 IND.

Figure 24: Razorbill counts (individuals) at Muck Island 2000–22. The dashed line represents the Locally Weighted Least Squares Regression trend in Razorbill numbers over time at Muck Island. The shaded region represents the 95% confidence interval around the trend.



Breeding success in 2022

The RSPB Life RAFT team monitored 157 Razorbill AONs across five sub-sites and recorded productivity of 0.61 chicks/AON. In 2019 a sample of 17 AON (not a formal SMP plot) were monitored on Rathlin Island near the West Light, producing six successful fledglings (0.35 chicks/AON) chicks/AON) (Else & Watson 2019).

Black Guillemot

Cepphus grylle

Conservation status: Amber-listed in the BoCCI4 (2020–26), Amber-listed in the BoCC5 (2021), Least Concern – IUCN Red List (Europe).

DANIEL JOHNSTON / BTO

Overview

Synopsis: The striking Black Guillemot (or Tystie) is a circumpolar auk which in the UK has historically been a predominantly Scottish species. They can be found around rocky shores and nest in natural or artificial crevices, making records of breeding pairs difficult. When Black Guillemots carry fish in their bills the way the fish point suggest that some individuals are right-handed, whilst some are left-handed (Ewins 1988).

UK population size, abundance and breeding success trends: There was insufficient coverage in the 1969–70 census to create a robust population estimate for Black Guillemot. Numbers appeared to remain stable between the 1985–88 census (37,745 individuals) and Seabird 2000 (38,714 individuals) (JNCC 2021). The SMP abundance index for Black Guillemot is very uncertain, but appears to have been relatively stable at 50–75% below the 1986 baseline (JNCC 2021); the most recent estimate puts the population at around 19,500 individuals (Mitchell *et al.* 2004; Woodward *et al.* 2020).

There was no statistically significant trend in Black Guillemot productivity at study sites (restricted to Orkney and Co. Down), which was on average 1.05 chicks per pair between 1986 and 2018 (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: Between the censuses in 1969–70 and 1985–88 Black Guillemot expanded their range in the Irish Sea, adopting the use of artificial structures such as harbour walls and jetties as nest sites. This is likely to have contributed to the 120% increase in Black Guillemots between the 1985–88 and 1998–2002 censuses, to 1,174 individuals (JNCC 2021). However, in 2017 and 2018, colonies representing 80% of the population recorded during Seabird 2000 were surveyed, with a total of 879 individuals recorded. The 11% decline observed may indicate a change in fortune for Black Guillemot in Northern Ireland (JNCC 2021).

The breeding success of Black Guillemots in Northern Ireland is mostly monitored through a study colony in Bangor, Co. Down (Greenwood 2010; Leonard & Wolsey 2014). On average between 1986 and 2018 productivity was 0.98 chicks per nest (JNCC 2021).

Abundance in 2022

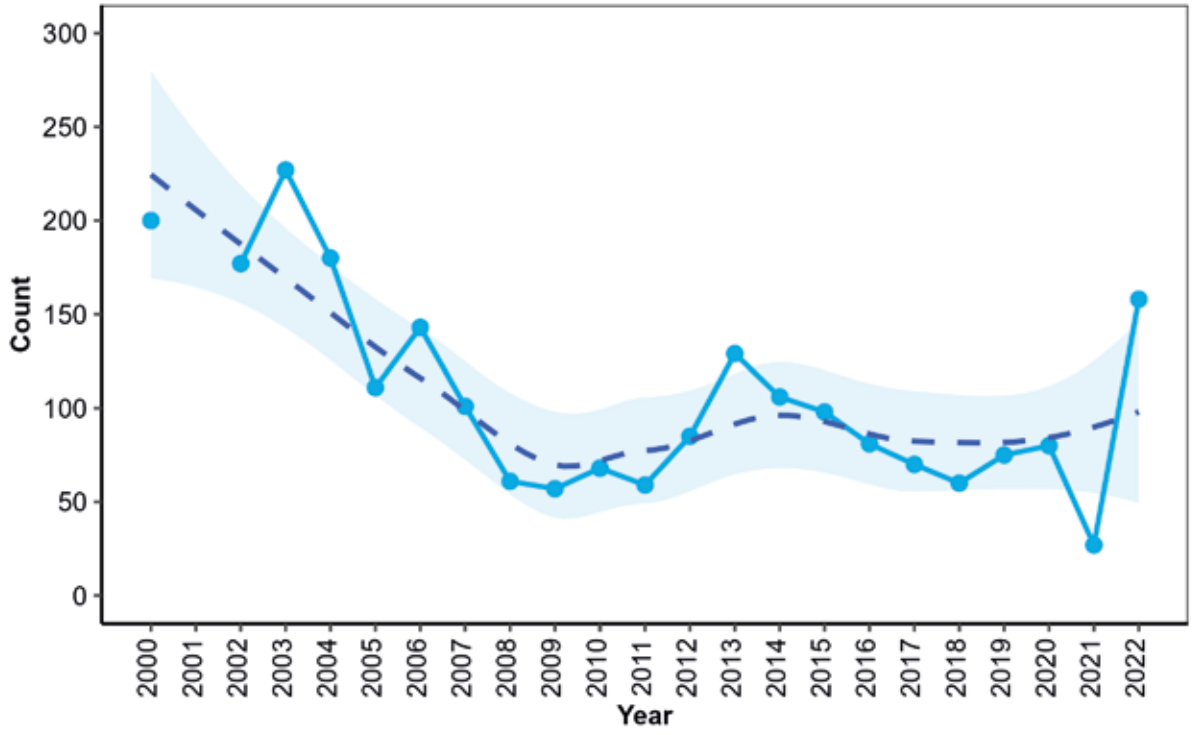
Monitoring effort for Black Guillemots was once again exceptional in 2022 (Table 6, Appendix), with 33 sub-sites surveyed by volunteers, in addition to those covered by RSPB, Ulster Wildlife and NIEA. A total of 924 Black Guillemots were counted around the coast in 2022, with the greatest concentrations found at Larne Lough (83 IND), Eden to Whitehead (207 IND) and Bangor Marina (89 IND). Although the Bangor population appears to be thriving in its nest boxes and harbour walls, increasing by 13% this year over the 2015–21 peak, the 2022 counts at Larne and Eden to Whitehead showed declines of 31% and 38%, respectively. In addition, a full survey of Belfast Harbour including further upstream in the River Lagan found 55 IND in 2022 (Table 6, Appendix), and while the area coverage of this survey was greater, this total was 55% down on the peak count of the 2015–21 period. The count of Black Guillemot AOS at Annalong was stable in 2022 (21 AOS), despite disruption to the colony and in-filling of nest holes caused by harbour restoration work.

Numbers recorded on Rathlin appear to have declined since the 1998–2002 census, but recent records may differ in their coverage and methodology, and so should be treated with caution (Figure 25). In 2022, a series of counts were made around the White Cliffs at Knockans between late March and mid-April, with an average of 158 IND and peak of 189 IND.

Notably, a survey of The Skerries in 2021 observed that there were 54 IND late in the season (June). While this is too late to get a good indication of the true number of breeders, it is a colony that has not been counted for the SMP in the past. This colony requires a boat to survey, and therefore was not monitored this year.

Increases and decreases around the Northern Irish coastline do not appear to have a spatial pattern and therefore may be due to stochastic effects; overall total numbers counted between 2021 and 2022 appear to be fairly stable.

Figure 25: Black Guillemot counts (individuals) at Rathlin Island, 2000–22. No data were available for 2001. The dashed line represents the Locally Weighted Least Squares Regression trend in Black Guillemot numbers over time. The shaded region represents the 95% confidence interval around the trend.



Breeding success in 2022

Only Annalong was monitored for breeding success this year, surveys recording 10 chicks from 21 AOS (0.48 chicks/AOS, Marc Vinas and Jessica Koquert). The breeding success of this colony has been consistent between the years it has been monitored (2020, 0.50 chicks/AOS; 2021, 0.48 chicks/AOS), even though fewer nesting crevices were available to the colony this year due to ongoing harbour works. It is likely that sensitive installation of nest boxes such as those deployed in Bangor Marina would benefit the Annalong colony and provide alternative nesting areas to crevices blocked during the development of the harbour.

On Lighthouse Island in 2021, 24 AOS were followed to chick stage out of the total of 27 AOS. Although the ultimate fate of all of the chicks could not be monitored, 19 chicks were presumed to have fledged, giving an estimated productivity of 0.79 chicks/nest (Daniel Johnston/Katherine Booth Jones, BTO, and the Copeland Bird Observatory).

Puffin

Fratercula arctica

Conservation status: Red-listed in BoCCI4 (2020–26), Red-listed in the BoCC5 (2021), EC Birds Directive – migratory species, Endangered – IUCN Red List (Europe).

SIMON GRAY

Overview

Synopsis: The Puffin is the most iconic and well-loved of all North Atlantic seabirds. They are a secretive bird on land, nesting in burrows, and until recently relatively little was known about their pelagic lifestyle. Their colourful beaks have been recorded carrying up to 62 small fish in one go (BirdLife International 2022).

UK population size, abundance and breeding success trends: Around 10% of the world population of Puffins breeds in the UK and Ireland, where it is the second most abundant breeding seabird (Mitche*ll et al.* 2004). The UK population of Puffin increased by 13% between the 1969–70 and, 1985–88 censuses, and by a further 19% to 580,714 AOB by Seabird 2000 (JNCC 2021). However, due to their burrow-nesting habits and often remote breeding sites, Puffins are a difficult species to monitor. Therefore, data collection is biased towards smaller colonies and counts of individuals, rather than AOB. Counts of individuals can vary quite markedly between years compared to counts of apparently occupied burrows and this makes it impossible to generate a reliable breeding abundance index for the UK population (JNCC 2021).

The breeding success of Puffins has been variable throughout the recording period, declining from the 1990s to early 2000s before then rising again (JNCC 2021). More recently in 2019, average breeding success was 0.71 chicks per pair (JNCC 2021).

Northern Ireland population size, abundance and breeding success trends: Although there was an apparent increase of 86% in Puffin AOB between the 1969–70 and 1985–88 censuses, Puffins had declined by 40% to 1,610 AOB by Seabird 2000 (JNCC 2021). Due to their increased European status, Puffins have been upgraded from Amber-listed to Red-listed in the latest Birds of Conservation Concern Ireland report (Gilbert e*t al.* 2021). The main colony in Northern Ireland is on Rathlin, which holds approximately 98% of the Northern Irish population. Small numbers also breed at The Gobbins and some are occasionally seen at Muck Island although breeding has not been confirmed. A conservation project on the Copeland Islands, using decoys and sound lures to attract birds, has resulted in a new colony with breeding confirmed in 2015 (Wolsey & Smyth 2017). This was a tremendous achievement and hopefully the start of a viable colony, proof that the use of sound lures and decoys can work for this species without the need for translocations.

The collection of productivity data in Northern Ireland has been limited; therefore productivity estimates cannot be modelled at the regional-level (JNCC 2021).

Abundance in 2021

No Puffins were observed at Muck Island again this year, and two AOB recorded in the Rathlin Island RSPB reserve (Table 6, Appendix). The full census of Rathlin for MarPAMM in 2021 revealed a count of 407 IND, which represented a decline of 74% since the 1998–2002 census. However, it must be noted that all censuses of Puffin on Rathlin Island are made later in the season than recommended (Walsh *et al.* 1995) due to the logistical difficulty of surveys, and therefore may not closely indicate the true size of the breeding population (Booth Jones *et al.* 2022). MarPAMM surveys also recorded two IND at Sheep Island in 2021.

Puffins continued to be present in encouraging numbers at Lighthouse Island, Copeland Islands, where a peak of 53 IND was estimated in mid April (Table 6, Appendix). The area of potential AOB, while not currently

monitored, appeared to have expanded outside the traditionally used area on the island (Katherine Booth Jones, Copeland Bird Observatory, pers. obs.).

In 2019, a peak count of 54 individuals was recorded at The Gobbins, in the same range as counts during 2013–18 (Table 6, Appendix), however this site has not been counted since.

Breeding success in 2021

Puffin nests were monitored by the RSPB Life RAFT team on Rathlin across three sub-sites, finding breeding success to be 0.47 across 131 AOB.

The Puffin colony on Lighthouse Island is not yet monitored for breeding success, but Puffins continue to be observed bringing prey back to the colony, confirming breeding (Copeland Bird Observatory, pers. comm.).

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HPAI in Northern Ireland's Seabirds 2022

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MIKE TOMS / BTO

Introduction

Avian Influenza has been present in wild bird populations for some time, particularly in waterfowl species. The strain H5N1 of Highly Pathogenic Avian Influenza (HPAI) has had particularly serious consequences, spreading across a range of bird species. In Northern Ireland, it was confirmed in a limited number of species in autumn 2021, including Mute Swan *Cygnus olor*, Greylag Goose *Anser anser* and Buzzard *Buteo buteo*. In 2022, the UK situation deteriorated rapidly with HPAI jumping across to populations of colonial-nesting seabirds.

The first indications that local seabirds were infected with HPAI came on in early June, with mortalities being increasingly reported during July. This coincided with the school holiday period and increased visitor numbers to the coastline, ensuring that more birds were reported. In addition to members of the public, reports were received from the National Trust and Ulster Wildlife. The RSPB provided more detailed information from Rathlin (see Table 1).

Table 1: Observed mortalities at Rathlin West Lighthouse to end July 2022 (provided by RSPB).

	Auk sp.		Kittiwake		Common Guillemot		Razorbill	Fulmar	Eider	Large gull sp.	Total
Age group	Adult	Chick	Adult	Chick	Adult	Chick	Adult	Adult	Adult		
West Lighthouse	50	160	26	Probable							236+
Seen at-sea from land Rathlin	20	20									40
On land / beaches Rathlin			5		20	20	1	1	2	5	54
Total	70	180	31	0	20	20	1	1	2	5	330

Methods

As a precautionary measure, NIEA took the decision to suspend certain activities licenced under the Wildlife Order (NI) 1985. These included research and ringing activities within seabird colonies, where direct access was deemed to be a biosecurity or disturbance risk. Some limited activity was permitted later in the season to allow trackers to be removed.

NIEA sits within the Department of Agriculture, Environment and Rural Affairs. DAERA vets have a primary remit in helping to protect the poultry-farming sector from the impacts of diseases like HPAI, and hence there was and remains a focus on determining the proximity of infected wild birds to domestic poultry. DAERA vets arranged for seabird carcasses to be collected for testing for HPAI. Once the disease was confirmed from a length

of coastline, it was assumed to be present in that area and no further carcasses were removed for testing. An exception was made for species of birds in which HPAI had not previously been confirmed.

By the start of August, HPAI-positive seabirds had been recorded from around the full length of the Northern Ireland coastline. It was not possible to recover the bodies of some species for testing, either due to delay in reporting or to local conditions making such recovery dangerous. As with wild bird corpses inland, there was an element of bias in reporting 'large white birds' as these were most noticeable. There may also have been some misidentification of birds reported by the public, particularly with older corpses. Photographs, where available, were of great value in determining species.

Northern Irish Mortalities

In total 13 species of seabirds were reported (Table 2), plus a further eight gulls not identified to species level. Guillemots were the most frequently reported species by a large margin. Of the 13 species, examples of eight plus an unidentified gull were recovered for testing. HPAI was confirmed in four species – Guillemot, Gannet, Razorbill, and the unidentified gull.

Table 2: Reported Northern Ireland seabird casualties up to the end of October 2022 (mortality factors other than HPAI may be involved for those species not tested).

Species	Number of dead birds reported	Number recovered for testing	HPAI status
Guillemot	112 (+ 250[1])	33	Positive (33 of 33)
Gannet	9	6	Positive (5 of 6)
Gull spp.	1	1	Positive
Razorbill	3+[2]	2	Positive (1 of 2)
Black-headed Gull	1	1	Negative
Common Gull	1	1	Negative
Cormorant	1	1	Negative
Herring Gull	1	1	Negative
Lesser Black-backed Gull	1	1	Negative
Black Guillemot	1	0	Not recovered
Fulmar	1	0	Not recovered
Great Black-backed Gull	2	0	Not recovered
Kittiwake	31	0	Not recovered
Large gull spp.	7	0	Not recovered
Manx Shearwater	9	0	Not recovered

[1] Unidentified auks on Rathlin are considered to be this species. [2] This excludes 'numbers' of Razorbills reported dead in the water off Muck Island in July.

Mortalities are considered to have been under-recorded, with an unknown number of birds having died at sea and been carried away by currents. Equally, the origin of casualties is not definitive. Gannets have clearly originated from colonies beyond Northern Ireland as they do not breed here, while the presumption is that the great majority of auks were local breeders although it is possible some may have come from colonies across the Irish Sea. The only known ringing recovery was of a long-dead Great Black-backed Gull, ringed in Dublin and recovered near Annalong, Co. Down in October.

More positively, coastal gull and tern colonies appear to have escaped HPAI over the 2022 breeding season. The only reported breeding mortalities were inland, of 10+ Black-headed Gull/ Common Tern chicks at the torpedo platform in Antrim Bay and are in line with normal background mortality to be expected at an active colony.

Looking Ahead

The impact of HPAI on UK seabird colonies in 2022 was unprecedented, but the virus should now be regarded as endemic in local and migratory wild bird populations. As such, it is a primary consideration in any future conservation plans and has been incorporated into the development of the Northern Ireland Seabird Conservation Strategy.

As can be seen from Table 2, current evidence is largely qualitative, and population-level impacts are currently uncertain. RSPB considered that there was minor overall impact on breeding success at the Rathlin West Light colony. Data and evidence requirements are being scoped for the 2023 breeding season, together with biosecurity protocols to permit research work at breeding colonies.

Much work is ongoing at a UK level to understand and mitigate the impacts of HPAI on wild birds.

What to do if you find a wild bird you suspect has died from HPAI

Current DAERA advice regarding wild birds can be accessed at:

Wild Birds and Advice for the Public | Department of Agriculture, Environment and Rural Affairs: **daera-ni.gov.uk**

At time of writing, DAERA is NOT collecting any dead birds for testing from coastal areas until further notice. However, dead wild birds (including seabirds) should still be reported to **BCSGeneral@daera-ni.gov.uk** to help inform our evidence base. Away from the coast, dead waterfowl (swans, geese or ducks) or other dead wild birds, such as gulls or birds of prey, should be reported to the DAERA helpline on 0300 200 7840.

Do not pick up or touch any dead or visibly sick birds that you find.

DAERA officials remain available to provide advice as and when required.

Conservation detection dogs: a novel method to survey for nesting seabirds

Caroline Finlay and Patrice Kerrigan
Conservation Detection Dogs Northern Ireland

GARY CLEWLEY / BTO : INSET PHOTO OF CAROLINE FINLAY AND RUFUS / PATRICE KERRIGAN

In 2021, we had the pleasure to work with Dr. Kendrew Colhoun and the wonderful people involved with the Marine Protected Areas Management and Monitoring (MarPAMM) project by testing a new possible aid in searching seabird burrows, conservation detection dogs! Caroline had been running the business Conservation Detection Dogs Northern Ireland for a couple of years by then, but this was the first time we were tasked to find a live species, an underground species, and one that required a lot of boat-hopping.

The premise behind this crazy idea was to prove that dogs could detect active Manx Shearwater burrows, speed up the process of playback studies, while also being more accurate with less disturbance. As usual, when starting a new project, the first step was to go straight to Google, but this time all we could find was a vague reference to a group in Canada using a dog to try and find any returning seabirds to an island after a rodent eradication.

Along with another dog team, consisting of a springer spaniel named Reid and his handler Rachel Cripps, we spent that summer in a whirlwind of trying out Manx Shearwater odours to train the dogs on (thank you to the bird ringers and Katherine at BTO Northern Ireland who helped with this). Patrice ran the tests for the dogs in the lab to make sure they could discriminate between Manxies (Manx Shearwater) and the other odours that would be in the environment, European Rabbits, Rabbit poo, and other bird species, which the dogs absolutely aced getting 100% accuracy in all trials. Then finally testing the dog in the field, letting our wonderful colleague Rufus use his nose to show us which burrows he believed the birds to be in. To check if he was right, we followed up with a speaker and endoscope.

We are really pleased that Rufus was able to identify burrows with Manx Shearwater adults and ignore empty burrows. Unfortunately, due to COVID-19 in 2021 and High Pathogenic Avian Influenza in 2022, we have yet to fully assess the viability of this method compared to playback studies. Everyone, keep your fingers crossed for 2023!

Even with these setbacks, we weren't deterred. In 2021, we were going through news articles, social media, and any source of information we could find on dog teams to gather information for the future. Now in 2022, we have a full season of fieldwork under our belts, so the question formed of how do we share our knowledge with future researchers, dog handlers, and dog trainers so they don't need to go through the trials and tribulations we've had to? The first step was to bring together everyone that was using, and training dogs for this work. After a call out on Twitter and emailing various detection dog organisations, we found seven separate qualifying people ready to get involved. They spanned five different countries, including the UK, USA, Canada, Cape Verde, and Ireland. Another Master's student, Beth McKeague, brought together our combined knowledge via a detailed survey study resulting in a range of recommendations to help the people contracting the dog team, the trainer of the dog, and the handler of the dog. A full analysis of the experiences we collected, and the recommendations created is currently in review as a publication.

Rufus indicating on a burrow. Caroline Finlay.

Here's a quick snippet of what you need to consider and inform the dog team of if you want to use this method in your own work:

- **getting to site.** You need to ensure you inform the dog team of what to expect so they can properly prepare their dog(s). For smaller boats, most dogs will need to work on boarding and the general experience of a smaller boat. The walkways used for jetties and piers are usually see-through which can be hard for a dog to comprehend meaning time may need to be allocated for travel practice. We can even train dogs to abseil with proper preparation if needed!
- **odour storage.** The dog must be imprinted onto the odour you want it to find. If you are out in the field working with that species already, that is a perfect time to collect samples. Ask the dog trainer what samples they require, but if you are collecting samples in the run-up to bringing in a dog team make sure you use unpowdered gloves for handling, use separate clean containers with airtight seals (sealable glass jars are best), and then ensure they are stored correctly. Carcasses and body parts are best kept in the freezer, feathers and swabs can be left in cool storage.
- **odour specificity.** We can train the dogs to discriminate between nearly anything, so if you want a dog to only find Manx Shearwater and ignore all other bird species this is possible. However, if you later decide you want to train that dog to find Storm Petrel after it has been trained not to, things get complicated. This needs to be discussed early in the dog's training.
- **indication.** When selecting a dog team, make sure they have a passive, non-invasive indication (how the dog communicates it's found something). We prefer to teach our dogs to sit and point at the burrow they believe a bird is in. Meaning that their head is out of the burrow, they are still and they're not damaging any of the fragile habitat around them.
- **on-site training.** Make sure you plan your project with on-site training scheduled in and budgeted for. The dog needs a chance to find the actual target species in its actual environment before it can do it operationally. This only needs to be a couple of days of training, but it could easily be forgotten within a project's schedule.

Our main advice is to talk to professional conservation detection dog organisations before you decide to bring a dog onto your team. We can help you decide if a dog will actually be a benefit to your project and the best way to move forward. If you have any questions about using dogs to help you find an elusive species, please get in touch by emailing **caroline@cddni.com**. All work completed by Conservation Detection Dogs Northern Ireland was done under licence.

Causeway Coast Cormorant counts on high

Richard Donaghey

Higher Scientific Officer – Regional Operations, Northern Ireland Environment Agency

LIZ CUTTING / BTO

The Cormorant, specifically the northern European subspecies *Phalacrocorax carbo carbo*, is a key constituent of the breeding seabird assemblage of the Causeway Coast and, until relatively recently, Sheep Island supported the largest breeding colony in Northern Ireland. In the 1990s the colony on Sheep Island was recognised and protected, both internationally – designated as a Special Protection Area (SPA), and nationally – designated as an Area of Special Scientific Interest (ASSI), with the breeding Cormorants as the qualifying Selection Feature. At the time of designation, the breeding population was around 250 pairs, which accounted for 7% of the Irish population and 3–5% of the UK population.

The designations bring with them a responsibility upon the Department (DAERA) to ensure that the Selection Features are maintained in a favourable condition, thus the broad Conservation Objective for Sheep Island is to maintain or enhance the population of the Cormorant. By means of a Condition Assessment of the SPA, monitoring of the population has traditionally been undertaken annually by the Regional Operations (RO) Staff from the Natural Environment Division (NED) of the Northern Ireland Environment Agency (NIEA).

In around 2010, a split in the colony was noted, with a proportion of the population moving to Castle Island (Little Skerrie), which is part of The Skerries group located off Portrush, where they had not previously been known to be breed. To enable rational monitoring of the Sheep Island colony, the population on Castle Island has since been included in the annual counts.

Traditionally the NED Cormorant counts were undertaken by landing on the islands by small boat and counting the number of active nests, as well as the number of eggs and chicks per nest in a single visit annually. The onset of the COVID-19 pandemic and a changeover of staff resulted in a break in the cycle and an evaluation of the practicalities and effectiveness of the surveys. New technologies, particularly drones, have proven to be incredibly valuable to monitor breeding birds across the globe in an unintrusive manner, particularly for difficult to access species. In 2021, the Marine Protected Areas Management and Monitoring (MarPAMM, Booth Jones *et al.* 2022[1]) INTERREG-funded programme successfully conducted a census of the breeding seabirds of the North Antrim Coast, which included a full drone survey of Sheep Island. The survey found 139 Apparently Occupied Nests (AON) for Cormorant and proved the successful application of drones for such a survey.

In 2022, it was intended to trial a dual-approach of both land-based and drone surveys of Sheep Island to test the accuracy of the counts achieved from the air. Unfortunately, the planned trip to the island on the 15 June could not proceed due to strong currents. On the 19 June, I was assisted by Gary Burrows from the Marine Conservation and Reporting Team of the Marine & Fisheries Division, who is an experienced drone pilot and armed with the appropriate equipment to complete the surveys of the two islands.

Due to the disturbance risk to breeding birds, wildlife licenses were secured from NIEA for both landing on the island and a separate license for the drone survey. The wildlife license for the latter was issued on the condition that the drone would maintain a minimum distance of 30 m from the island, that the drone would be withdrawn if disturbance was noted and on the premise that an experienced ornithologist and drone operator would be present.

For the survey itself, Gary piloted the drone and took a range of images covering the entire island, both directly above and some at lower angles, whilst I observed through a spotting scope. I was able to monitor the reaction of all the bird species on the island to the presence of the drone and was pleased to confirm the birds seemed oblivious to its presence. A similar process was repeated for Castle Island two days later.

With the images uploaded to a computer I was able to count the Cormorant AON. Some nests are very obvious with huddles of large chicks, whilst others show sitting adults in circles of light brown dirt surrounded by the white guano (their faeces is propelled, so does not land directly on the nest). An example can be seen in the image below (Figure 1). Not all the images were taken from directly above, and instead some were taken at lower elevations, which proved helpful in assessing the AON and also ruling out the Shag nests on the sheer cliff faces (Figure 2), with huddles of their chicks appearing similar to a sitting Cormorant in some instances.

Figure 1: Counting Cormorant nests on Sheep Island from drone footage. Purple circles show confirmed or very likely AON, while the yellow circles are possible AON. Figure 2: Shag nests as observed from drone footage. Images by Gary Burrows.

The final counts were 86 (possibly as many as 92) AON on Sheep Island and 193 (possibly 202) AON on Castle Island. From our own counts and other data included in the 2021 Northern Ireland Seabird Report (Booth Jones 2022), it is noted that Skerries colony has been increasing in recent years with counts of 60, 94 and 137 in 2007-2019 but our count of 193 AON was high in comparison. The Sheep Island count was considerably down on the MarPAMM survey in 2021 which recorded 139 AON. For Sheep Island, I also tested out counting the Cormorant AON with my spotting scope simultaneously and estimated 82, with 122 adults present, which wasn't far off the drone count.

When assessing the data together, from the most recent accurate counts, the population appears to be stable with 279 AON in 2021, and 276 AON in a combination of the 2021 and 2019 counts. Being a long-lived bird which lacks many predators, the increase on The Skerries and the decrease in Sheep Island is very similar and supports the idea that birds continue to interchange between colonies.

From the site selection point of view of a Cormorant, Sheep Island looks more favourable in the nesting habitat available and the sheer 30 m cliffs around the island but, for reasons not yet confirmed, the population has diminished. Site selection may be determined early in the season and any form of disturbance may drive birds to relocate and this may explain some of the prolonged laying which has been noted. For example, I recorded eggs on Sheep Island as early as the 24 March, while some small chicks were present in the surveys in late June. It takes roughly 80–85 days for Cormorant to fledge from laying, so in theory some of the nests recorded in March may have already fledged by the 24 June, thus laying could vary by perhaps up to six to seven weeks.

This year, Biosecurity for LIFE[2] (an RPSB-managed project), in collaboration with the National Trust landowners, began the process of monitoring for signs of rats on Sheep Island, which are known to be an issue on the island. Sheep Island SPA is one of the sites included in the Biosecurity for LIFE project to have a biosecurity plan developed. With previous experience of accessing the island and maintaining the rope access, Regional Operations staff joined the trips to install (and remove) the monitoring equipment which included trail cameras, tracking tunnels and chew blocks. Whilst on the island it was clear to see signs of rats right across the island with trails, burrows and droppings, suggesting plentiful activity. Although the rats did avoid the tunnels and chew blocks, the trail cameras did record Brown Rats *Rattus norvegicus*, all in the cover of darkness. It is unclear what impact the rats may be having on the Cormorant population, but it seems reasonable to assume that Rats could predate unattended eggs and small chicks in their first weeks of life.

What is notable is the lack of other breeding birds on the summit of the island, with the exception of a handful of large gull nests and a single feral Greylag Goose nest, with all other nesting birds restricted to the inaccessible cliffs. In assessing the habitat, it is very suitable for a range of breeding birds, including suitable habitat for the likes of Puffins, which may have nested on the island historically. Recent human activity was noted on the island between our visits, including tampering with some of the monitoring equipment, confirming some anthropogenic disturbance, which had seemed unlikely.

So what for the future of monitoring the Cormorants on the Causeway Coast? Boat surveys can be useful for some seabird monitoring but considering the two islands are steep sided and tall, achieving an accurate count is very difficult. I participated in a boat-based seabird survey of The Skerries in 2021 as a volunteer for BTO and counted just 82 Cormorant AON on Castle Island, but in having seen the nesting locations from the drone images, it seems very likely that many nests were not visible from the sea. Observing Sheep Island from the mainland at equal height could be used if essential but it may provide lower counts and views are limited to the southern rim of the island.

Realistically there are two viable options, land-based and by drone, which both have their strengths and weaknesses. Landing on the island has the benefit of accurate counts, ability to count chicks and eggs, assess productivity over multiple visits, monitor the impact of rats and marine litter etc. On the flipside, there is much disturbance to the Cormorants which all vacate their nests, potentially leaving chicks and eggs susceptible to gulls and other predators, the disturbance to other breeding birds on the island, the challenging access which involves jumping from a boat on to slippery rocks, clambering up steep slopes with the assistance of ropes and working on cliff edges, the cost of chartering a boat, and the difficulty of matching ideal weather, tides, currents and staff availability.

The drone survey leads to little to no disturbance to the birds, it is cost and time efficient and, as the Cormorant is large bird which prefers to nest in an open flat location, the drone counts will be relatively accurate. It may be worthwhile in future years to test the accuracy by doing both land and drone counts to compare the results, but drone surveys may prove to be the best option going forward.

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[1] The €6M MarPAMM project is supported by the European Union's INTERREG VA Programme, managed by the Special EU Programmes Body (SEUPB). **https://www.mpa-management.eu**

[2] Biosecurity for LIFE is a partnership between RSPB, National Trust and National Trust for Scotland, it is funded by EU LIFE Environmental Governance and Information [LIFE17 GIE/UK/000572], NatureScot, Natural England, Natural Resources Wales and the Northern Ireland Department for Agriculture, Environment and Rural Affairs

Black Guillemot foraging ecology in Northern Ireland to inform Marine Protected Area plans

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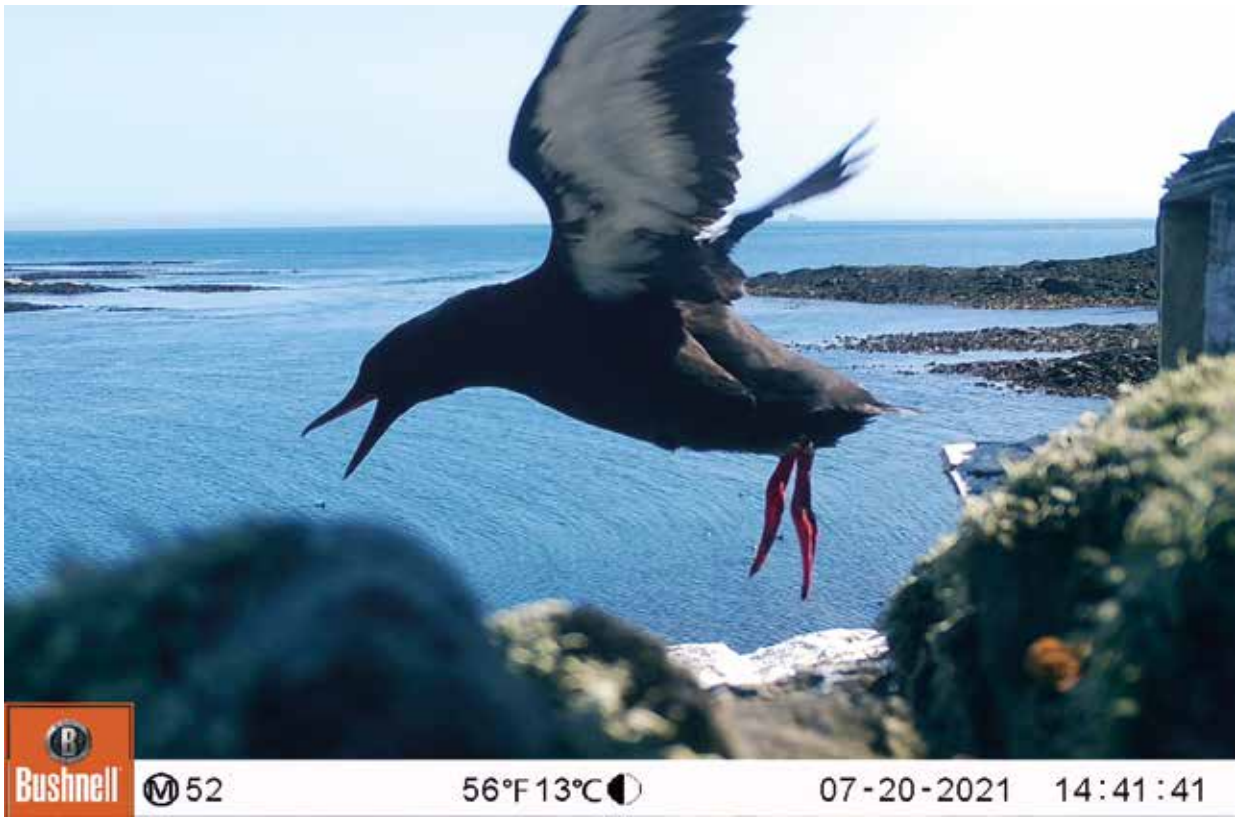
KATHERINE BOOTH JONES / BTO

Introduction

Renewed interest in Black Guillemot foraging ecology within the UK has arisen in the last decade from the need to inform Marine Protected Area (MPA) plans being devised for the species. These include management plans being drawn up by the Marine Protected Area Monitoring and Management (MarPAMM) project, which aims to provide a toolkit for MPA management within the cross-border regions between Northern Ireland, the west of Scotland and the Republic of Ireland. Black Guillemots are the only seabird species not recognised under Annex 1 of the EU Birds Directive, and therefore do not qualify for Special Protected Area (SPA) protection allocated to migratory seabirds. MPAs are of increasing importance to Black Guillemot conservation as a means of mitigating the potential threats arising from invasive predators, climate change, fisheries bycatch, and renewable energy developments. Northern Ireland contains around 1,600 individual Black Guillemots, forming 4% of the UK's population (Booth Jones 2022). Within the region, Black Guillemot colonies have displayed variable trends, with increases in some areas potentially bolstered by increased nesting opportunities provided by nest boxes (Leonard & Wolsey 2015), while displaying declines in other areas, potentially due to invasive predator presence, such as on Rathlin Island (Booth Jones *et al.* 2022; It's Here: Rathlin Bird Report 2017 | Rathlin Stickybeak, n.d.).

Figure 1: Camera trap image of a Black Guillemot leaving the nest box after delivering a Butterfish to a chick. Photo: Daniel Johnston.



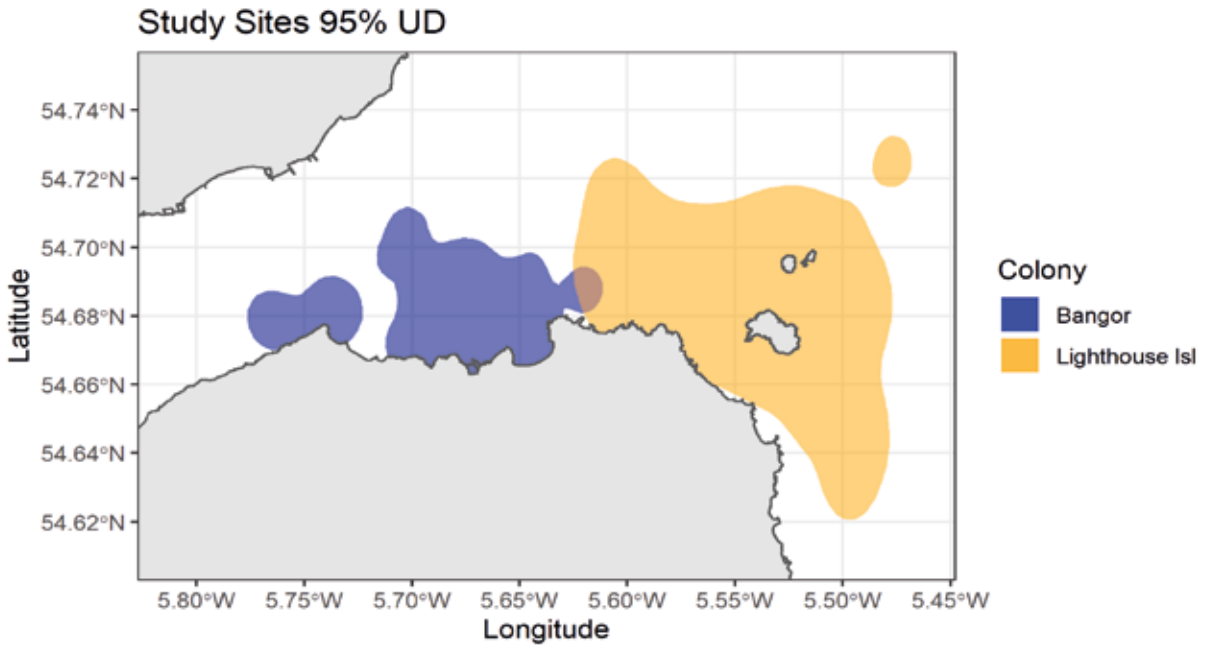
MPA designation may be informed by Global Positioning System (GPS) tracking to discover seabird foraging range and habitat preference (Thaxter *et al.* 2012). Over the last decade, knowledge of Black Guillemot foraging ecology has been growing, with tracking technology informing on dive depths (Masden *et al.* 2013; Shoji *et al.* 2015), and area use (Johnston *et al.* 2021; Owen *et al.* 2019). To build upon this knowledge, and inform on MPA management plans, tracking of breeding adult Black Guillemots using GPS and GPS/Time Depth Recorder (TDR) tags was conducted to quantify distribution and habitat use at two sites in Northern Ireland during the 2021 breeding season.

Deployments were conducted by BTO in collaboration with Elizabeth Masden from the Environmental Research Institute, a part of the University of the Highlands and Islands (ERI-UHI). Birds were tagged during the breeding season at two established colonies in Northern Ireland: Bangor Harbour and Lighthouse Island. At both locations, birds were breeding within within nest boxes installed locally by the late Julian Greenwood and Copeland Bird Observatory. Birds were caught during the late incubation stage in June, with some individuals retaining tags into the chick rearing stage (Johnston *et al.* 2022). Camera traps were also placed outside a sample of nest entrances to provide an indication of prey species being brought back to chicks (Johnston 2022, Figure 1.).

Birds were found to remain close inshore (<5 km) in relation to their breeding colonies. Through the combination of GPS and TDR records, maximum dive depths were observed to correspond with seafloor depth profiles, indicating benthic foraging behaviour. Using Hidden-Markov Models, we identified potential locations associated with foraging (Figure 2). We then examined those foraging locations in relation to environmental characteristics which define the seafloor, including bathymetry, tidal currents and substrate. The foraging habitat characteristics which birds selected were often found to be individual-specific. Inter-individual variation was most frequently seen in relation to the strength of tidal currents and substrate composition. Across individuals, birds often selected habitat related to kelp or muddy sand. Overall, birds from both colonies foraged within depths shallower than 30 m, despite deeper depths being available within their range.

Despite this variation in foraging behaviour between individuals, across the Lighthouse Island colony the composition of prey being provisioned to chicks was largely comprised of Butterfish *Pholis gunnellus* (Johnston 2022), indicating they are an important prey resource.

Figure 2: 95% Utilisation Distribution contours produced from tracking data from Bangor and Lighthouse Island.



These results are indicated that if MPAs are extended to include the seas around the colony, with importance given to local depth profiles, protection is likely to encompass the main areas used by Black Guillemots. Much is still to be learnt about the benefits of certain foraging areas over others, and the degree to which these are vulnerable to climate change, fisheries, or marine renewables. A limitation of our study was that both colonies we studied were located in Belfast Lough, and Black Guillemot foraging behaviours may vary according to local conditions elsewhere in Northern Ireland. Additionally, tracking is currently confined to the breeding season, due limited length of tag attachments. As Black Guillemots are non-migratory, winter movement behaviour is an important consideration to assess the year-round applicability of MPAs.

In addition to foraging habitat, another consideration for MPAs designated for Black Guillemots is their breeding habitat. Landward boundaries have previously been dedicated to Black Guillemots in Scottish MPAs to encompass nesting sites (Marine Scotland and SNH 2012) as the impact invasive mammals predating on nesting Black Guillemots, in the short-term, will likely outweigh foraging habitat degradation. Within Northern Ireland, Black Guillemots primarily nest within inaccessible harbours or secluded islands, behaviour indicative of predation pressure. The potential decline of the Black Guillemot population on Rathlin Island (page 61 of this report), currently within a Marine Conservation Zone which holds Black Guillemots as a feature, illustrates the urgency of this threat.

While there is still much to learn about Black Guillemot foraging and breeding habitat, our research adds to a growing understanding of Black Guillemot foraging behaviour, allowing MPAs to be better informed and effective for this species. A full version of the report can be found here: **https://www.mpa-management.eu/?page_id=617**

This work is part of the Marine Protected Areas Management and Monitoring Project (MarPAMM) project (**https://www.mpa-management.eu**). This project has been supported by the EU's INTERREG VA Programme, managed by the Special EU Programmes Body. We thank the members of the Project Steering Group which comprised of Naomi Wilson (AFBI), Chelsea Ward (MSS), Neil McCulloch (DAERA), and Kendrew Colhoun (BirdWatch Ireland).

Thanks David Galbraith, Wesley Smyth, and the Copeland Bird Observatory for helping make the fieldwork on Lighthouse Island possible. Fieldwork within Bangor would not have been possible without the help and support of Shane Wolsey, Paul and Gillian Thallon, the staff of Bangor Marina, and the staff of BJ Marine.

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Sandwich Tern Colour-Ringing Project 2020-2022

Hugh Thurgate
National Trust

INSET: SANDWICH TERN G-4J3 AT GREENWAYS STRAND SOUTH AFRICA, 15 FEBRUARY 2022 / THEUNS KRUGER

During the challenging summer of 2022, with persistent inclement weather and the spectre of avian flu hanging over us, we still managed to colour ring 70 Sandwich Tern chicks to add to the 108 ringed in 2021. As I write, re-sightings of 2022 fledglings are beginning to filter through, 12 so far with three before mid July, a fortnight earlier than last year.

In the months following fledging in 2021, 21 colour-ringed individuals were spotted as they winged their way south across to north-west England and Wales and then along the western seaboard of Europe and the continent of Africa, with a total of 38 re-sightings. So, this was an amazing amount of data gathered in such a short time for relatively little effort! Two fledglings, 4L6 (ringed on Swan Island) and 4R7 (ringed on Jackdaw Island) were each seen four times on their migration; the most of any individual. 4R7 was ringed as a chick on 18 June on Jackdaw Island. It was then seen in the Rogerstown Estuary, Co. Dublin on 1 September and nine days later at Skerries still on the north side of Dublin. By 15 March 2022, this bird had migrated right down to Swakopmund in Namibia, a distance of just under 5,500 miles! The record movement involved 4J3 and 4J5, possibly siblings. They had not been seen in the autumn but were observed within two days of one another at the end of the winter (13 and 15 February 2022) when adult birds certainly would be heading back up to their breeding colonies. These birds had flown 6,153 miles, all the way to the Western Cape, South Africa. They had actually passed the Cape of Good Hope!

From our re-sightings thus far, it would appear that our juvenile Sandwich Terns leave their breeding colonies pretty rapidly post-fledging. There is then a general south/south-easterly movement, either along the eastern coast of Ireland or straight across to North Wales and the north-western English coastline. This area would appear to be an important staging area for onward migration, holding our birds throughout August into early September before they start to drift south. Last year, 87% of birds re-sighted were seen between late July and mid September, the majority along the North Wales coast where there are plenty of birders happy to trawl through roosts of gulls and terns with telescopes and digital cameras.

Once they head out to the Bay of Biscay, encounters with birders rapidly diminish and we're really relying on ornithologists in Namibia and South Africa for re-sightings. But it's early days and there is a huge amount of data to come. Sandwich Tern do not breed until they are three or four years of age so we are unlikely to see many more re-sightings of the "Class of '21" until 2024 and 2025 when hopefully some will be picked up at breeding colonies in the UK and north-western Europe (not all young will return to their natal area) and on their subsequent migrations.

It is however very early days in the project and certainly too early to draw conclusions about patterns of movement and staging areas. There have been movements this autumn that were not seen in 2021; for example, one fledgling was re-sighted in Killala Bay, Co. Sligo on 28 July, a journey of 140 miles on a bearing of 266 degrees! It would seem reasonable to surmise that this bird flew directly west, right across the country and not around the coastline to get there. Another bird flew 240 miles north-north-east, not south-east as one might predict, all the way to Findhorn Bay on the Moray Firth. So, I think it's fair to say: expect the unexpected! Whilst these 'anomalies' are perhaps the most interesting recoveries and excite the imagination it will be the clusters and identification of staging areas that will be of greater importance; improving our understanding of the birds ecology and informing possible targeted conservation efforts

Strangford Lough Seabird Monitoring Report 2022

Hugh Thurgate
National Trust

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May and June 2022 were punctuated by cold, grey days, with frequent strong winds. This presented a major challenge to the timing and completion of seabird monitoring on the islands of Strangford Lough. If the air temperature was cool, there was no sun. If it was sunny there was a strong wind. If conditions were good the wind would be in the wrong direction on a dropping tide. Endless challenges. There were many days when counts had to be postponed or undertaken in sub-optimal conditions. In short, it was a very trying monitoring season, with constant frustrations with the unseasonable weather. However, having said this, ultimately, I was reasonably content with the quality of the data gathered but this can only happen when seabird monitoring is considered to be the highest priority work and trumps everything else. DAERA restrictions to accessing seabird colonies in response to the Highly Pathogenic Avian Influenza outbreak in seabirds, which could have been the final straw, thankfully were imposed late in the monitoring season and did not affect the collection of breeding data but did prevent late visits to Jackdaw Island for the purposes of colour ringing the Sandwich Terns. Other than a single devastating attack on Common Tern chicks on Shones Island, almost certainly by Mink, productivity on a broad front was not thought to be adversely affected by predation, though localised impact by large gulls may have had an impact. The single most important factor in affecting productivity this year was the weather. Extreme weather between 23 and 27 June with 25 mph winds recorded on 25 June and torrential rains brought in on a south-easterly gale to severe gale on 26 June caused heavy losses to low-lying Common and Arctic Tern nests at the egg or young chick stage, in particular.

Cormorant: 364 AON in one colony. Numbers of breeding birds on a par with 2021 (370 AON). The colony 'shape' changed again this year with a significant reduction in the numbers using the western shoreline, down to 99 from 187. The eastern 'sub-colony' increased from 183 to 235 and a discrete third colony of 30 in the south-western corner of the island appeared this year.

Black-headed Gull: 1,297 AON in 10 colonies. The population of Black-headed Gulls on Strangford Lough has been relatively stable for the last 12 years with 2022's 1,297 AON representing 98.4% of the five-year rolling mean and 103.2% of the ten-year rolling mean (calculated from five and ten consecutive years of data respectively up to and including 2022 but excluding 2020 when seabird monitoring was restricted due to COVID-19). There was a slight increase in the lough 'proper' population, but a proportionately larger drop in the Castle Espie population from 854 to 640 AON

Individual colony counts (AON):

- Swan Island: 277
- Jackdaw Island: 218
- Dunsy Rock: 52
- North Boretree Rock: 39
- Chanderies: 28
- Hen Island: 22
- Green Island Rock: 13
- Dunnyneill: 3
- Shones Island: 1
- Castle Espie: 640

Mediterranean Gull: Two AON in one colony. Productivity: 2.0 (chicks fledged per pair). Although this species first bred on Strangford Lough in 2001, it has been an intermittent breeder ever since and has yet to establish a regular breeding colony. It has never exceeded three breeding pairs in any one season. Its preference appears to be to breed within the largest of the Black-headed Gull colonies although on a few occasions it has nested amongst concentrations of Common Gull aggregations. On 3 June 2022, two adults and one first summer bird were recorded on Dunsy Island (Kerry Leonard – pers. comm.), but these were not recorded there before or after that date so were not considered to have bred. They may have been visiting from Jackdaw Island where four adults and one second-summer bird were observed on 20 June. A total of four fledged chicks were recorded from offshore on 7 July (Kerry Leonard – pers. comm.). One of the breeding birds was colour-ringed with a three-digit black alphanumeric code on a white background. Unfortunately, it was not possible to observe this leg ring through a telescope. There are currently five Mediterranean Gull colour ring schemes in Europe using white rings with black inscriptions, four in Belgium (two of these include locations in the Netherlands) and one in Poland but only one is using a three-coded inscription. This scheme covers sites in both Netherlands and Belgium. It would be very interesting to follow this bird up next year, if indeed it returns to Jackdaw Island.

Common Gull: 315 AON in 20 colonies. Numbers rose during the first decade of the millennia, peaking in 2010 with 532 pairs, then dropped back for a couple of years but have been stable since then, with a 10-year rolling mean of 323 AON and five-year rolling mean of 312 AON. A completely new colony was discovered on Pawle Island this year and turned out to be the second largest on the lough. The colony on Pawle is using a topographically similar area to that occupied by the largest colony on the lough, on Roe Island, a broad, flat, 'shelf', just above the high tide mark. The colony on Trasnagh occurs on a high tumbledown stone wall on the periphery of the island and virtually all the pairs on the Lough choose to nest just above the mean high tide mark.

Individual colony counts (AON):

- Roe Island: 74
- Pawle Island: 50
- Trasnagh Island: 39
- Chanderies: 36
- Green Island (Killyleagh): 34
- Little Minnis's: 19
- Salt Island: 16
- Inisharoan: 12
- Jackdaw Island: 9
- South Sheelahs Island: 8
- Boretree Island (West): 4
- Gabbock Island: 3
- Swan Island: 2
- Calf Island: 2
- Round Island: 2
- Sheelah's Island: 1
- Shones Island: 1
- Dunnyneill: 1
- Peggy's Island: 1
- Black Rock (Ringdufferin): 1

Lesser Black-backed Gull: 339 AON in 16 colonies. The Lesser Black-backed Gull population has been relatively stable since 2010. From 2008 to 2009 there was a significant increase in the number of breeding pairs and then another jump in 2010. This year's total compares favourably with the five-year rolling mean of 350 AON. Seventy-five percent of the lough's population occurs on just five islands. On virtually all the islands' Herring Gulls outnumber Lesser Black-backed Gulls except on Ogilby where it was the Lesser Black-backed Gull and not Herring Gull that 'replaced' what had once been a thriving Black-headed Gulls colony from 2012.

Individual colony counts (AON):

- Green Island (Killyleagh): 81
- Ogilby Island: 5
- Boretree Island (East): 44
- Drummond Island: 41
- Great Minnis's: 32

- Bird Island: 24
- Round Island: 18
- Jackdaw Island: 14
- Salt Rock (Boretrees): 7
- Boretree Island (West): 6
- Inishanier Island: 5
- Gabbock Island: 3
- Chanderies: 3
- Dunnyneill (Lower): 2
- Gull Rock (Boretrees): 1
- Black Rock (Ringdufferin): 1

Herring Gull: 1,520 AON in 22 colonies. The Herring Gull population on the lough continues to increase, up 9.4% on 2021's total, which itself was 9% up on 2019's. In 2022 there was a significant rise on Green Island (Killyleagh), historically one of their main strongholds. Indeed 90% of the lough's population is concentrated on just six islands.

Individual colony counts (AON):

- Green Island (Killyleagh): 458
- Round Island: 260
- Drummond Island: 186
- Bird Island: 152
- Inishanier Island.: 101
- Boretree Island (East): 97
- Jackdaw Island: 47
- Gabbock Island: 46
- Ogilby Island: 41
- Great Minnis: 41
- Dunnyneill: 36
- Inisharoan Island: 10
- Sheelah's Island: 8
- South Sheelah's Island: 8
- Boretree Island (West): 7
- Little Minnis's: 7
- Roe Island: 6
- Dunnyneill (Higher): 4
- Chanderies: 2
- Dunsy Rock: 1
- Gull Rock (Boretrees): 1
- Turley Rock: 1

Great Black-backed Gull: 127 AON in 5 colonies. Again, Great Black-backs were stable with this year's count sitting close to the five-year rolling mean of 124 AON. The number of AON passed 100 for the first time in 2013 and then every year from and including 2016. There is one main colony on Great Minnis's and a growing but small colony on Boretree Island (West).

Individual colony counts (AON):

- Great Minnis's: 116
- Boretree Island (West): 8
- Dunsy Rock:1
- Gabbock Island: 1
- Bird Island (Kircubbin): 1

Sandwich Tern: 310 AON in two colonies. Mean clutch size – 1.39 per pair, productivity (fledged young per nest) – 0.25. The Strangford Lough population of 310 pairs represents approximately 8.4% of the All-Ireland population (Seabird 2000) and is therefore nationally significant, but not internationally significant, as this falls below 1% of the biogeographic population. Whilst 310 AON was a notable improvement on 2021 (an increase of 43%), the species is continuing at a low ebb, with a five-year rolling mean of just 398 AON This five-year mean compares with a ten-year rolling mean of 518 AON and a 20-year rolling mean of 883 AON.

There were two colonies in 2022, one of which fared well and the other very badly. No Sandwich Terns bred on Swan Island this year for the first time since 2013. It could just be coincidence but this year's figure of 164 AON on Black Rock (no birds bred on Black Rock last year) is very similar to the colony size on Swan Island last year of 158 AON. This begs the question: does a breeding group that shifts location take longer to settle than one that returns to the same island it bred on last year? The late start on Black Rock would support this theory. The Jackdaw Island colony contained two discrete groupings with the easterly concentration of 57 AON starting later than the westerly aggregation of 89 AON. The fact that there were two 'sub' colonies commencing breeding at different times could suggest that the group of 57 included last year's colony of 39 and that the 89 were new birds. However, this would not follow the above theory that birds returning to the same breeding location begin breeding earlier!

Throughout the monitoring period neither sub-colony appeared to suffer from any significant predation losses though the eastern colony was thought to have suffered heavy losses due to a bad period of weather at the end of June. Productivity monitoring was undertaken this year by Kerry Leonard of Sterna Environmental Ltd. on behalf of National Trust. A National Trust nest count on Jackdaw Island on 30 May was timed to coincide with the very end of incubation for the majority of birds. The mean clutch size on this visit was 1.46 with 80 complete clutches of one egg, 65 of two eggs, and one of three eggs. Seventy-nine young were thought to have fledged giving a productivity figure of 0.54 young fledged per pair. The Black Rock colony was established significantly later-on in the season with just four clutches recorded on 24 May and seven on 3 June. However, by 20 June a colony of 164 AON had established with 111 clutches of one egg and 53 clutches of two eggs with a mean clutch size of 1.32 per pair. This lower mean clutch size is typical of later starting colonies which are often made up of younger birds whose productivity is typically lower than earlier layers. This colony was adjudged to be on the point of hatching on this visit. Tragically, this later nesting colony was obliterated in the dreadful weather over the weekend of 25–26 June. Just nine of the 164 clutches that were recorded on 20 June were still present on 27 June and not a single Sandwich Tern was thought to have fledged. This brought the overall productivity for 2022 for this species on Strangford Lough down to just 0.25 young fledged per pair. Productivity in 2019 was 0.64 and 0.2 in 2018. UK productivity data for Sandwich Tern from 1986 to 2019 showed between 0.2 and 0.9 young fledged per pair (the majority of these sites were from England). RSPB data for 2014–2021 for Carlingford Lough showed productivity of between 0 and 0.83 and in 2021, 0.45 for Larne Lough.

Individual colony counts (AON):

- Black Rock (Ringdufferin): 164
- Jackdaw Island: 146

Common Tern: 450 AON on 12 colonies. Productivity – 0.09 (based on data from eight colonies). The Strangford Lough population of 450 pairs represents approximately 10.6% of the All-Ireland population and therefore is nationally significant. Common Tern often nest at or on the mean high water mark, and therefore are very vulnerable to the 'perfect storm': strong onshore winds coinciding with a spring tide and a low pressure weather system sitting above the country. Some of the islands on Strangford Lough are on their last legs, i.e those which have virtually no elevated ground. They are today's islands but tomorrow's pladdies; rocky outcrops exposed at low tide but completely covered on all high tides. Of the 12 colonies selected by Common Tern for nesting in 2022, at least seven fall into this description. Even on islands where there is security from high tides due to the island's elevation such as Swan Island or Dunsy Rock, Common Tern will typically nest very close to the high tide mark. It's a costly behavioural trait exacerbated where colonies are subjected to predation pressure. Counts of young close to fledging, undertaken as part of the productivity monitoring project, revealed an overall number of young fledged per pair across the lough of just 0.09 (cf. 2019 = 0.86 and 2018 = 0.08). Shones Island that had a thriving Common Tern colony on 20 June, with a significant number of mature chicks close to fledging, was subject to a large scale predation event sometime between 3 and 7 July, probably by Mink, that led to near total devastation, with only the largest and most fortunate chicks finding temporary refuge on floating seaweed just off the edge of the island. Some young of course may have succeeded in fledging between 20 June and this event.

Individual colony counts (AON):

- Shones Island: 92
- Swan Island: 91
- Dunsy Rock: 85
- North Boretree Rock: 60
- Chanderies: 44

- Green Island Rock:34
- South Sheelah's: 15
- Black Rock (Ringdufferin): 14
- Gull Rock (Boretrees): 10
- Salt Rock (Boretrees): 2
- Hen Island: 2
- Jackdaw Island:1

Arctic Tern: 173 AON at eight colonies. Productivity – 0.01 (based on data from three colonies). The Strangford Lough population of 173 pairs represents approximately 4.9% of the All-Ireland population and is therefore nationally significant. In 2022, Arctic Tern also fared badly due principally to adverse weather conditions late on in incubation or early chick stage. They are every bit as vulnerable to tidal wash-outs as the Common Tern, possibly more so due to a greater proportion of their nests having little or no nest structure. Common Tern typically add material to the nest scrape which can act as a slight buffer to the tide and they often nest on dried desiccating wrack on the tide-line that has a degree of buoyancy under inundation, unlike Arctic Terns. The overall number of young adjudged to have fledged this season was just two individuals, in effect total failure across the Lough.

Individual colony counts (AON):

- Chanderies:58
- Swan Island: 43
- Salt Rock (Boretrees): 35
- Sheelah's Island: 13
- Shones Island: 11
- Dunsy Rock: 7
- North Boretree Rock: 5
- South Sheelah's Island: 1

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Appendix: Species Counts

Table 6: Cumulative counts (N) of all species of seabird within Seabird Monitoring Programme (SMP) 'Master Sites' in Northern Ireland between 2015 and 2021. The number of sub-sites surveyed in a Master Site, an indication of relative survey effort between years, is included in brackets next to the count unless the sub-sites were not specified (NR = not recorded). Hyphens (-) denote that no data were collected. Seabirds are counted using recommended census units from Table 3, unless specified with the record. EST means that numbers are an estimate, based on the best available method. Asterisks (*) denote that the count was made late in the season and therefore may include non-breeders .

		2015	2016	2017	2018	2019	2020	2021	2022
Species (Count units)	**Master Site**	**N (sites)**	**N (sites)**	**N (sites)**	**N (sites)**	**N (sites)**	**N (sites)**	**N (sites)**	**N (sites)**
Fulmar	Binevenagh	-	-	-	-	-	-	11 (5)	7 (5)
(AOS)	Downhill	135 (6)	78 (4)	81 (4)	88 (6)	95 (5)	-	130 (6)	44 (6)
	North Antrim Coast	16 (10)	37 (10)	38 (10)	16 (9)	21 (4)	4 (1)	12 (7)	13 (7)
	The Skerries	-	-	-	-	-	-	43 (5)	-
	Sheep Island	-	-	-	-	-	-	61 (1)	-
	Rathlin Island (RSPB reserve)	-	-	28 (3)	25 (3)	10 (NR)	-	7 (NR)	9 (NR)
	Rathlin Island – full island census	-	-	-	-	-	-	1,038 (25)	-
	Giants Causeway Coast	-	-	-	55 (5)	134 (2)	66 (1)	209 (4)	-
	Causeway Coast	-	-	-	84 (1)	100 (3)	159 (3)	880 (18)	-
	East Antrim Coast	31 (21)	45 (16)	60 (11)	34 (12)	40 (14)	32 (13)	39 (10)	32, 2 EST (10)
	Larne Lough to Portmuck	2 (2)	2 (1)	6 (1)	2 (1)	3 (1)	-	2 (1)	1 (1)
	Muck Island	52 (1)	68 (1)	80 (1)	72 (1)	43 (1)	56 (1)	61 (1)	69 (1)
	The Gobbins	201 (5)	290 (NR)	310 (NR)	326 (5)	215 (5)	-	-	-
	Blackhead	3 (1)	3 (1)	29 (1)	30 (1)	31 (1)	19 (1)	6 (1)	11 (1)
	Whitehead	3 (1)	3 (1)	5 (1)	7 (1)	5 (1)	8 (1)	7 (1)	5 (1)
	Copeland Islands	-	-	-	6 (1)	8 (1)	-	13 (1)	-
	Maggy's Leap to Newcastle	12 (1)	-	-	-	2 (1)	2 (1)	0 (1)	0 (1)
Cormorant	North Antrim coast	-	-	-	-	-	4 (1)	0 (7)	-
(AON)	The Skerries	64 (1)	-	60 (1)	94 (1)	137 (1)	-	82 (6)	193 (1)
	Sheep Island	66 (1)	84 (1)	100 (1)	88 (1)	-	-	139 (1)	86 (1)
	The Gobbins	0 (5)	12 (NR)	13 (NR)	12 (5)	0 (5)	-	-	-
	Outer Ards	-	-	-	53 (7)	77 (7)	0 (3)	0 (2)	0 (2)
	Strangford Lough	245 (NR)	343 (NR)	360 (NR)	314 (NR)	388 (NR)	167 (NR)	82 (NR)	364 (NR)
	Lough Neagh and Lough Beg SPA (Antrim)				-	-	620 Ind (6)*	330 Ind (6)	186 Ind (8)
	Lough Neagh and Lough Beg SPA (Tyrone)				-	-	150 Ind (3)*	64 Ind (3)	43 Ind (3)
	Lough Neagh and Lough Beg SPA (Armagh)				-	-	0 Ind (3)*	108 Ind (3)	0 Ind (4)

Shag (AON)	Downhill	3 (2)	0 (4)	-	0 (6)	38 (1)	-	13 AON, 1 Ind (6)	13 (6)
	North Antrim coast	2 (1)	1 (10)	1 (10)	2 (9)	0 (7)	0 (1)	8 (7)	6 (7)
	The Skerries	64 (1)	-	-	-	-	-	32 (6)	-
	Sheep Island	66 (1)	-	-	-	-	-	21 AON, 22 Ind (1)	-
	Rathlin Island (RSPB reserve)	42 (NR)	47 (NR)	51 (NR)	55 (NR)	65 (NR)	-	38 (NR)	42 (NR)
	Rathlin Island – full island census	-	-	-	-	-	-	74 (25)	-
	Causeway Coast	-	-	-	-	-	-	14 (18)	-
	The Maidens	-	-	-	20 (NR)	-	-	-	-
	Muck Island	17 (1)	21 (1)	30 (1)	34 (1)	38 (1)	31 (1)	67 (1)	71 (1)
	The Gobbins	20 (5)	22 (NR)	20 (NR)	25 (5)	20 (5)	-	-	-
	Maggy's Leap to Newcastle	4 (1)	3 (1)	-	-	0 (1)	15 (1)	12 (1)	10 (1)
	Donard Cove	3 (1)	3 (1)	5 (1)	-	9 (1)	0 (1)	-	-
Great Skua (AOT)	Rathlin Island (RSPB reserve)	-	1 (NR)	1 (NR)	1 (NR)	1 (NR)	-	1 (NR)	-
	Rathlin Island – full island census	-	-	-	-	-	-	2 (25)	-
Kittiwake (AON)	Downhill	92 (2)	-	-	0 (6)	0 (5)	-	102 (6)	130 (6)
	North Antrim coast	207 (10)	279 (10)	236 (10)	293 (9)	332 (6)	141 (1)	423 (7)	499 (7)
	The Skerries	-	-	-	-	-	-	58 (6)	-
	Sheep Island	-	-	-	-	-	-	230 AON, 75 Ind (1)	-
	Rathlin Island (RSPB reserve)	-	-	340	313 (3)	56 (NR)	-	61 (NR)	74 (NR)
	Rathlin Island – full island census	-	-	-	-	-	-	13,706 (25)	-
	Causeway Coast	-	-	-	-	-	-	562 AON, 635 Ind (18)	-
	Muck Island	225 (1)	351 (1)	369 (1)	314 (1)	519 (1)	521 (1)	603 (1)	711 (1)
	The Gobbins	835 (5)	1,072 (NR)	1,053 (NR)	683 (5)	1145 (5)	-	-	-
	Maggy's Leap to Newcastle	483 (1)	-	-	513 (1)	671 (1)	717 (1)	759 (1)	611* (1)
Black-headed Gull (AON)	Rathlin Island – full island census	-	-	-	-	-	-	5 (25)	-
	Copeland Islands	-	-	-	-	-	-	1 AON (1)	-
	Larne Lough	1,825 (2)	3,102 (2)	3,060 (2)	2,895 (2)	2,618 (2)	2,000 EST (1)	2236 (2)	2,089 (2)
	Belfast Harbour	~450 (1)	386 (1)	717 (1)	607 (1)	560 (1)	806 (1)	702 (1)	1,500 (1)

	Outer Ards	135 (NR)	67 (NR)	93 (7)	189 (7)	239 (7)	-	134 (7)	230 (2)
	Strangford Lough	1,265 (NR)	1,312 (NR)	1,524 (NR)	1,267 (NR)	1,305 (NR)	-	1,420 (NR)	1,297 (100
	Carlingford Lough	1 (1)	-	-	-	-	-	-	-
	Lower Lough Erne	1,026 (NR)	1,238 (NR)	1,216 (NR)	1,218 (NR)	1,718 (NR)	-	1,416 (NR)	1,255 (NR)
	Moorlough Lake	0 (1)	66 Ind (1)	-	93 (1)	-	-	-	-
	Lough Vearty	5 (1)	-	0 (1)	-	-	-	-	-
	Lough Neagh and Lough Beg (Londonderry)	-	250 Ind (2)	-	40 (3)	-	20 Ind (1)	2 Ind (1)	20 Ind (1)
	Lough Neagh and Lough Beg (Antrim)	95 (1)	4,565 Ind 95 AON (9)	115 (1)	191 AON, 4,368 Ind (8)	-	104 AON, 7,454 Ind (8)*	121 AON, 3,990 Ind (7)	126 AON + 2,679 Ind (8)
	Lough Neagh and Lough Beg (Tyrone)	-	6,750 Ind (4)	-	4,250 Ind (3)	-	2,700 Ind (2)*	2,400 Ind (3)	1,225 Ind (3)
	Lough Neagh and Lough Beg (Armagh)	-	30 Ind (6)	-	118 Ind (5)	-	18 Ind (1)*	220 Ind (3)	95 Ind (4)
	Antrim Town	-	15 (1)	-	-	-	-	-	-
Mediterranean Gull (AON)	Larne Lough	5 (2)	5 (2)	2 (2)	5 (2)	0 (2)	1 (2)	3 (2)	4 (2)
	Belfast Harbour	-	2 (1)	5 (1)	7 (1)	3 (1)	-	1 (1)	4 (1)
	Strangford Lough	1 (NR)	0 (NR)	0 (NR)	2 (NR)	0 (NR)	-	1 Ind (NR)	2 (NR)
	Lower Lough Erne	1 (NR)	1 Ind (NR)	1 (NR)	1 Ind (NR)	1 Ind (NR)	-	0 (NR)	1 Ind (NR)
	Lough Neagh and Lough Beg (Antrim)	-	1 Ind (9)	-	2 Ind (8)	-	-	0 (6)	0 (8)
Common Gull (AON)	Rathlin Island (RSPB reserve)	76 (NR)	84 (NR)	70 (NR)	62 (NR)	21 (NR)	-	30 (NR)	42 (NR)
	Rathlin Island – full island census	-	-	-	-	-	-	69 (25)	-
	Causeway Coast	-	-	-	-	-	-	EST 16 AOT (18)	-
	East Antrim Coast	-	-	22 Ind (1)	-	-	0 (14)	EST 3 AOT (3)	-
	Larne Lough	24 (NR)	27 (NR)	32 (NR)	37 (NR)	9 (2)	22 (2)	28 (2)	45 (2)
	Muck Island	20 (1)	-	51 Ind (1)	-	0 (1)	34 EST (1)	23 (1)	28 (1)
	Outer Ards	-	1 (NR)	9 (7)	10 (7)	9 (7)	0 (1)	7 (1)	5 (2)
	Copeland Islands	-	-	-	15 (1)	30 Ind (1)	-	-	-
	Strangford Lough	229 (NR)	333 (NR)	322 (NR)	293 (NR)	346 (NR)	-	274 (NR)	320 (20)
	Carlingford Lough	1 (1)	3 (1)	6 (1)	6 (1)	9 (1)	1 EST (1)	5 (1)	0 (1)
	Lower Lough Erne	163 (NR)	189 (NR)	143 (NR)	262 (NR)	337 (NR)	-	249 EST (NR)	238 (NR)
	Lough Vearty	16 (1)	3 (1)	8 Ind (1)	-	-	-	-	-
	Lough Galboly	0	-	22 Ind (1)	-	13 Ind (1)	-	-	-
	Lough Neagh and Lough Beg (Antrim)	-	-	-	-	-	-	2 Ind (6)	0 (8)
	Lough Neagh and Lough Beg (Armagh)	-	15 (6)	-	0 (8)	-	-	0 (3)	0 (4)

Lesser Black-backed Gull (AON)	The Skerries	-	-	-	-	-	-	3 + 534 EST (6)	-
	Sheep Island	-	-	-	-	-	-	88 AOT (1)	-
	Rathlin Island – full island census	-	-	-	-	-	-	519 (25)	-
	Causeway Coast	-	-	-	-	-	-	2 AOT, 1 AON, (18)	-
	East Antrim Coast	-	-	-	-	-	-	2 Ind (3)	-
	Muck Island	-	-	-	-	-	13 EST (1)	11 (1)	19 (1)
	Belfast Harbour	-	-	1 (1)	1 (1)	-	-	-	0 (1)
	Belfast (city centre)	-	-	-	101 (1)	221 (1)	-	-	-
	Copeland Islands	-	-	-	365	547 (1)	-	390 (1)	602 (1)
	Strangford Lough	433 (NR)	298 (NR)	343 (NR)	310 (NR)	316 (NR)	-	442 (NR)	339 (16)
	Carlingford Lough	-	-	-	-	-	-	0 (1)	2 (1)
	Lower Lough Erne	1,211 (NR)	1,185 (NR)	1,316 (NR)	1,622 (NR)	1,584 (NR)	-	1,437 EST	1,653 EST (NR)
	Lough Neagh and Lough Beg (Londonderry)	-	0 (2)	-	230 Ind 20 AON (3)	-	0 (1)*	0 (1)	0 (1)
	Lough Neagh and Lough Beg (Antrim)	-	980 Ind (9)	-	830 Ind (8)	-	1,303 Ind (6)*	878 Ind (6)	608 Ind (8)
	Lough Neagh and Lough Beg (Tyrone)	-	353 Ind (4)	-	360 Ind (3)	-	380 Ind (3)*	585 Ind (3)	550 Ind (3)
	Lough Neagh and Lough Beg (Armagh)	-	390 Ind (6)	-	612 Ind 3 AON (5)	-	320 Ind (3)*	250 Ind (3)	385 Ind (4)
	Antrim Town	-	600 (1)	-	-	-	-	-	-
Herring Gull (AON)	North Antrim coast	-	-	-	-	-	-	1 AOT	0 (7)
	The Skerries	-	-	-	-	-	-	25 + 204 EST	-
	Sheep Island	-	-	-	-	-	-	55 AOT (1)	-
	Rathlin Island – full island census	-	-	-	-	-	-	83 (25)	-
	Causeway Coast	-	-	-	-	-	-	11 AON, 8 AOT, 28 Ind (18)	-
	East Antrim Coast	-	-	-	-	-	-	36 Ind (3)	-
	Muck Island	-	-	-	-	-	17 EST	18 (1)	25 (1)
	The Gobbins	2 (5)	2 (NR)	1 (NR)	-	0 (5)	-	-	-
	Belfast (city centre)	-	-	-	16 (1)	39 (1)	-	-	-
	Outer Ards	-	-	-	187 (3)	199 (7)	0 (1)	0 (1)	3 (2)

	Copeland Islands	-	-	-	483 (1)	483 (1)	-	585 (1)	680 (1)
	Strangford Lough	679 (NR)	1,177 (NR)	1,070 (NR)	1,061 (NR)	1,273 (NR)	-	1,389 (NR)	1,523 (22)
	Maggy's Leap to Newcastle	4 (1)	-	-	-	1 (1)	1 (1)	0 (1)	-
	Carlingford Lough	-	0 (1)	-	-	1 (1)	-	12 (1)	20 (1)
	Lower Lough Erne	4 (NR)	5 (NR)	5 (NR)	5 (NR)	3 (NR)	-	0 (NR)	3 (NR)
	Lough Neagh and Lough Beg (Antrim)	-	-	-	-	-	-	2 Ind (6)	0 (8)
	Antrim Town	-	15 (1)	-	-	-	-	-	-
Great Black-backed Gull	The Skerries	-	-	-	-	-	-	4 (6)	-
(AON)	Sheep Island	-	-	-	-	-	-	7 AOT (1)	-
	Rathlin Island – full island census	-	-	-	-	-	-	12 (25)	-
	The Maidens	-	-	-	8 Ind (1)	-	-	-	-
	Muck Island	1 (1)	-	2 (1)	2 (1)	0 (1)	4 (1)	11 (1)	4 (1)
	The Gobbins	2 (5)	1 (NR)	2 (NR)	2 (5)	0 (5)	-	-	-
	Outer Ards	-	-	-	40 (3)	42 (7)	0 (1)	0 (1)	0 (1)
	Strangford Lough	62 (NR)	125 (NR)	114 (NR)	129 (NR)	107 (NR)	-	143 (NR)	127 (NR)
	Maggy's Leap to Newcastle	3 (1)	-	2 (1)	-	1 (1)	-	0 (1)	2 (1)
	Carlingford Lough	2 (1)	2 (1)	2 (1)	4 (1)	0 (1)	-	0 (1)	0 (1)
	Lower Lough Erne	2 (NR)	4 (NR)	4 (NR)	2 (NR)	3 (NR)	-	1 (NR)	2 (NR)
	Lough Neagh and Lough Beg (Antrim)	-	-	-	-	-	-	1 Ind (6)	0 (8)
	Lough Neagh and Lough Beg (Armagh)	-	1 (6)	1 (1)	1 (5)	-	2 AOT (2)*	1 Ind (3)	5 Ind (4)
Sandwich Tern	Larne Lough	694 (2)	1,229 (2)	1,141 2)	732 (2)	1,010 (2)	900 EST (1)	1,113 (2)	1,254 (2)
(AON)	Outer Ards	0 (1)	0 (1)	-	92 (3)	61 (7)	14 (2)	14 (1)	48 (2)
	Strangford Lough	581 (NR)	337 (NR)	775 (NR)	776 (NR)	434 (NR)	252 (NR)	217 (NR)	310 (2)
	Carlingford Lough	250 (1)	7 (1)	71 (1)	13 (1)	24 (1)	-	52 (1)	0 (1)
	Lower Lough Erne	138 (NR)	226 (NR)	316 (NR)	250 (NR)	230 (NR)	143 (NR)	126 (NR)	102 (NR)
Common Tern	Larne Lough	353 (2)	333 (2)	355 2)	307 (2)	303 (2)	187 (NR)	157 (2)	129 (2)
(AON)	Belfast Harbour	344 (1)	418 (1)	367 (1)	385 (1)	672 (1)	80 (1)	485 (1)	360 (1)
	Belfast Channels	7 (1)	12 (1)	13 (1)	-	17 (1)	29 (1)	32 (1)	-
	Outer Ards	3 (NR)	18 (NR)	23 (7)	17 (7)	21 (7)	25 (3)	13 (1)	31 (2)
	Strangford Lough	401 (NR)	457 (NR)	262 (NR)	340 (NR)	262 (NR)	228 (NR)	312 (NR)	449 (12)

	Carlingford Lough	220 (1)	123 (1)	147 (1)	70 (1)	56 (1)	25 (1)	84 (1)	96 'Commic' AON 1
	Lower Lough Erne	30 (NR)	41 (NR)	51 (NR)	52 (NR)	54 (NR)	36 (NR)	26 (NR)	33 (NR)
	Moorlough Lake	0 (1)	4 (1)	-	2 (1)	-	-	-	-
	Lough Neagh and Lough Beg (Antrim)	84 (1)	240 Ind 75 AON (9)	271 Ind 102 AON (4)	246 Ind 135 AON (8)	128 AON (1)	68 AON (1), 75 Ind (6)*	37 AON (1)* + 159 Ind (6)	34 AON + 115 Ind (8)
	Lough Neagh and Lough Beg (Tyrone)	-	-	-	-	-	-	2 Ind (3)	0 (3)
	Lough Neagh and Lough Beg (Armagh)	-	3 Ind (6)	60 Ind (1)	123 Ind (5)	-	-	99 Ind (3)	5 AON + 60 Ind (4)
Roseate Tern (AON)	Larne Lough	1 (2)	1 (2)	1 (2)	1 (2)	1 (2)	1 (1)	1 (2)	1 (2)
Arctic Tern (AON)	Sheep Island	-	-	-	-	-	-	2 Ind (1)	-
	Larne Lough	1 (2)	0 (2)	0 (2)	0 (2)	0 (2)	0 (1)	0 (2)	0 (2)
	Belfast Harbour	83 (1)	4 (1)	0 (1)	15 (1)	15 (1)	0 (1)	0 (1)	3 (1)
	Outer Ards	105 (NR)	43 (NR)	269 (7)	343 (7)	255 (7)	177 (3)	216 (1)	306 (2)
	Copeland Islands	-	-	-	46 (1)	75 AON, 150 Ind (2)	200 EST (1)	0 (1)	-
	Strangford Lough	194 (NR)	173 (NR)	73 (NR)	193 (NR)	245 (NR)	105 (NR)	201 (NR)	173 (NR)
	Carlingford Lough	85 (1)	41 (1)	20 (1)	70 (1)	50 (1)	-	-	96 'Commic' AON (1)
Guillemot (IND)	Sheep Island	-	-	-	-	-	-	703 (1)	-
	Rathlin Island (RSPB reserve)	-	-	3,470 (3)	3,454 (3)	-	-	677 (NR)	691 (NR)
	Rathlin Island – full island census	-	-	-	-	-	-	149,510 (25)	-
	Causeway Coast	-	-	-	-	-	-	278 (18)	-
	Muck Island	2,070 (1)	2,926 (1)	2,554 (1)	2,478 (1)	2,782 (1)	3,107 (1)	2,340 (1)	2,868 (1)
	The Gobbins	2137 (5)	2,675 (5)	2,326 (5)	2,284 (5)	2,617 (5)	-	-	-
Razorbill (IND)	The Skerries	-	-	-	-	-	-	28 (6)	-
	Sheep Island	-	-	-	-	-	-	221 (1)	-
	Rathlin Island (RSPB reserve)	716 (NR)	698 (NR)	707 (3)	683 (3)	-	-	146 (NR)	130 (NR)
	Rathlin Island – full island census	-	-	-	-	-	-	22,421 (25)	-
	Causeway Coast	-	-	-	-	-	-	361 (18)	-
	Muck Island	671 (1)	1,048 (1)	799 (1)	736 (1)	1,118 (1)	871 (1)	605 (1)	314 (1)
	The Gobbins	506 (5)	858 (5)	560 (5)	882 (5)	679 (5)	-	-	-
	Copeland Islands	-	-	-	-	-	-	20 EST (1)	-

Black Guillemot (IND)	Lough Foyle – Tysties	-	6 (2)	0 (3)	-	-	-	20 (1)	-
	Magilligan to Castlerock – Tysties	-	-	-	-	16 (1)	-	10 (1)	1 AOS + 15 Ind (2)
	The Barmouth (River Bann) to Portrush Bay – Tysties	15 (1)	11 (1)	-	22 (1)	26 (1)	-	17 (1)	16 (1)
	Portrush Harbour	-	18 (1)	22 (1)	14 (1)	25 (1)	-	25 (1)	21 (1)
	The Skerry Islands – Tysties	-	-	-	-	-	-	54 (1)*	-
	The White Rocks to Runkerry Point – Tysties	-	-	-	-	-	-	5 (1)	3 (1)
	Runkerry to Benbane Head – Tysties	30 (1)	-	-		62 (1)		58 (2)	62 (2)
	Bengore Head	-	-	-	-	3 (1)	-	-	-
	Portbradden / Island Lean Quay / Carrickarede – Tysties	-	7 (1)	-	-	0 (1)	-	16 (2)	-
	Ballycastle – Tysties	-	12 (3)	-	-	-	-	10 (2)	-
	Rathlin Island – Tysties	98 (1)	81 (1)	70 (1)	60 (1)	-	80 (1)	27 (1)	158 average (1)
	Larne to Torr Head – Tysties	65 (1)	8 (2)	78 (4)	84 (4)	9 (5)	58 (1)	70 (10)	72 (4)
	Larne Lough and Island Magee – Tysties	202 (3)	195 (3)	117 (3)	161 (3)	11 (1)	16 (1)	91 (2)	128 (4)
	Muck Island	6 (1)	8 (1)	0 (1)	14 (1)	-	42 (1)	4 (1)	8 (1)
	Whitehead Town – Tysties	3 (1)	0 (1)	0 (1)	1 (1)	0 (1)	-	1 (1)	0 (1)
	Carrickfergus to White Head – Tysties	174 (2)	135 (2)	198 (2)	140 (1)	93 (1)	-	-	137 EST (2)
	Belfast (Harbour) – Tysties	122 (1)	113 (1)	113 (1)	-	-	8 (1)	58 (3)	133 (4)
	Belfast to Grey Point – Tysties	-	0 (1)	0 (1)	7 (1)	0 (1)	-	7 (1)	-
	Grey Point to Bangor –Tysties	-	0 (1)	0 (1)	-	1 (1)	-	4 (1)	11 (1)
	Bangor – Tysties	-	56 (1)	0 (1)	76 (1)	57 (1)	-	75 (1)	89 (1)
	Bangor to Groomsport – Tysties	-	0 (1)	0 (1)	10 (1)	-	-	-	-
	Groomsport – Tysties	9 (1)	10 (1)	16 (1)	-	-	-	-	23 (1)
	Copeland Islands – Tysties	-	-	-	100 (1)	60 (1)	-	60 Ind, 27 AOS (1)	69 + 1 AOS (2)
	Donaghadee – Tysties	10 (1)	8 (1)	6 (1)	-	9 (1)	-	-	-
	Ballywalter – Tysties	8 (1)	8 (1)	2 (1)	-	8 (1)	-	-	-
	Ballywalter to Ballyhalbert – Tysties	-	-	0 (1)	-	-	3 (1)	-	-
	Ballyhalbert – Tysties	4 (1)	2 (1)	0 (1)	-	1 (1)	-	-	-
	Portavogie – Tysties	12 (1)	12 (1)	2 (1)	-	12 (1)	-	-	-
	Strangford Lough – Tysties	10 (1)	9 (1)	30 (7)	23 (4)	-	0 (2)	10 (2)	19 (3)
	Strangford to Ardglass – Tysties	-	-	-	-	-	-	14 (1)	5 (1)

	Ardglass – Tysties	16 (1)	16 (1)	18 (1)	-	-	-	-	-
	Bloody Bridge to Newcastle – Tysties	-	-	-	9 (1)	26 (1)	6 (1)	-	-
	Mourne Coast – Tysties	-	-	-	25 (1)	11 (11)	-	-	49 EST (1)
	Annalong Harbour – Tysties	-	39	0	34	58	38	58 Ind, 21 AOS (1)	21 AOS (1)
	Kilkeel Harbour – Tysties	26 (1)	-	-	6 (1)	-	-	14 (1)	-
	Carlingford Lough – Tysties	33 (1)	23 (1)	27 (1)	57 (1)	42 (1)	-	37 (1)	22 (3)
Puffin	Sheep Island							2 (1)	-
(IND)	Rathlin Island (RSPB reserve)	3 (NR)	5 (NR)	6 (3)	3 (3)	75 (1)	-	1 AOB (NR)	2 AOB (NR)
	Rathlin Island – full island census	-	-	-	-	-	-	407 (25)	-
	Muck Island	-	-	-	-	-	1 (1)*	0 (1)	0 (1)
	The Gobbins	63 (5)	52 (5)	57 (5)	55 (5)	54 (5)	-	-	-
	Copeland Islands	-	-	-	100 Ind, est 11 yes - can't geyt in	106 (1)	106 (1)*	68 (1)	53 Ind (1)

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