Northern Ireland Seabird Report 2014

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Northern Ireland Seabird Report 2014

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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Articles by contributors included in this report have not been subject to editorial control or scientific peer-review and therefore reflect their individual work, views and conclusions and not those of the BTO.

Editorial

This is the second edition of the Northern Ireland Seabird Report, covering 2014. This report is the published outcome of the work of the British Trust for Ornithology (BTO) Seabird Co-ordinator, appointed in February 2013, and the activities of the evolving Northern Ireland Seabird Network of volunteers, and organisations such as National Trust, Ulster Wildlife and the Royal Society for the Protection of Birds (RSPB) that have provided data for 2014 and previous years.

Interest in Northern Ireland's marine environment continues to grow. The process of designating Marine Conservation Zones in Northern Ireland waters is ongoing, and there is considerable effort being put into consideration of a number of SPA extensions. Despite the recent withdrawal of proposals for the development of an offshore wind farm off the Co. Down coast, there are many other developments being considered in Northern Ireland's marine environment. Designations and planning consents all require high quality marine biodiversity data of various types, including for birds.

At the core of the Seabird Network in Northern Ireland are our surveyors. Some work for Government bodies such as NIEA, while others survey on behalf of NGOs such as RSPB, Ulster Wildlife and the National Trust. We are grateful for their co-operation and assistance. Many other surveyors are volunteers who give up their time freely to help, simply because of a love and admiration of these bird species. The amount and quality of work that can be undertaken by volunteers is amazing and in 2014 we were fortunate that many new and enthusiastic people joined the already talented Seabird Network. The Seabird Network now numbers 60 people, a great achievement when there were only 20 people in Northern Ireland surveying seabirds just two years ago.

The report on breeding seabirds in Northern Ireland during 2014 presented here is similar to 2013. We have kept the detail from previous years, even where data have changed little since our last 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 JNCC and their online SMP report and this is doubtless the best way to present such a report.

We would like to thank everyone who has contributed to this report and to encourage more people to join the Seabird Network and contribute to future reports. Naturally a summary such as this does not reference every single piece of data collected but each tiny piece really is of value in understanding our local seabirds. A report such as this is only as robust as the data it contains, as we are aware, so if you have seabird population data, either recent or historic, then please share it with us, and JNCC, for the benefit of seabirds in Northern Ireland.

Shane Wolsey
BTO NI Officer

Kerry Leonard
BTO NI Seabird Co-ordinator

February 2015

JON LEES

Seabird Monitoring Overview

The National Seabird Monitoring Programme

Since 1986 the majority of annual seabird surveillance in the UK has been undertaken as part of the Seabird Monitoring Programme (SMP) coordinated by the Joint Nature Conservation Committee (JNCC). The programme is a partnership of stakeholder organisations throughout the UK, including, amongst others, the BTO, RSPB, The Seabird Group and the statutory country agencies. In order to examine trends at individual colonies, and across the UK, it is a great advantage if individual sites can be monitored consistently for many years. Data are gathered in a consistent manner using standard published methods and entered into a central database. The SMP gathers data relating to:

1. Breeding abundance – the number of breeding pairs or individuals, which is a medium to long term measure; and
2. Breeding success – the number of eggs laid and, ultimately, chicks fledged.

The SMP generates annual population indices which are expressed as a percentage of the population recorded at sites in 1986 when standardised monitoring began.

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 a number of reasons:

- seabirds are an important component of marine biodiversity in the UK with approximately seven million individuals breeding;
- 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 European law and the UK has obligations to monitor and protect populations; and
- monitoring provides data which underpin targeted conservation policy development and action.

The Northern Ireland Seabird Co-ordinator Role

In 2013 a three year post, the 'Northern Ireland Seabird Co-ordinator', funded by the Northern Ireland Environment Agency (NIEA), was created by the BTO. The main aim of the Seabird Co-ordinator is to facilitate an increase in annual seabird monitoring across Northern Ireland. The Co-ordinator works closely with JNCC and has created a definitive register of Northern Ireland sites, compiled an annual report on the state of seabird populations (this report), and co-ordinated monitoring and research in Northern Ireland. At the outset a Seabird Steering Group was formed to advise on the development of a five year strategy, and to advise on the evolution of a Northern Ireland wide group of volunteers and the programme of activities that the Seabird Co-ordinator is undertaking. A network of seabird surveyors and researchers in Northern Ireland has been created through the work of the Co-ordinator (the NI Seabird Network). More detailed information relating to the aims of the Seabird Co-ordinator is available in the Appendix.

The Northern Ireland Strategy for Seabird Monitoring

The strategy for monitoring seabirds in Northern Ireland until 2018 has been set down in a data collection strategy. Current annual population monitoring and productivity monitoring in Northern Ireland has concentrated on a small number of important sites, with monitoring carried out by local and national NGOs. The strategy provides the context and sets minimum requirements for the annual monitoring of breeding seabirds in Northern Ireland to facilitate effective management of this natural resource. This document has been prepared with the advice of the NI Seabird Steering Group and JNCC. The NI Seabird Steering Group is made up of Dave Allen (Allen & Mellon Environmental), Kendrew Colhoun (RSPB), Kerry Leonard (BTO), Neil McCulloch (NIEA), Andrew Upton (National Trust) and Shane Wolsey (BTO).

The strategy focuses on the monitoring of populations and productivity in Northern Ireland while also facilitating further detailed studies of those populations. The main objectives are:

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

[1]**http://jncc.defra.gov.uk/page-1550**

The Northern Ireland Site Register

During 2013 a full register of all known, possible or potential seabird nesting sites, which is consistent with the SMP site register, was created. In reality this means that every part of the Northern Ireland coastline now has a recording section. All known inland sites are also listed. Due to legacy issues from historical record keeping, and the way data are held in the JNCC database, Black Guillemots have their own site register.

JILL PAKENHAM

Breeding Seabirds in Northern Ireland in 2014

Kerry Leonard
BTO NI Seabird Co-ordinator

The following species accounts summarise the known status of each breeding seabird species in Northern Ireland. Species accounts also provide a summary of population trends at the main breeding sites, where those data exists. These data were collected by a large number of 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, and 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	BOCCI Status*	IUCN Status**
Northern Fulmar	N	GREEN	Least Concern
Manx Shearwater	N	AMBER	Least Concern
European Storm-petrel***	N	AMBER	Least Concern
Great Cormorant	N	AMBER	Least Concern
European Shag	N	AMBER	Least Concern
Great Skua	N	AMBER	Least Concern
Black-legged Kittiwake	N	AMBER	Least Concern
Black-headed Gull	Y	RED	Least Concern
Mediterranean Gull	N	AMBER	Least Concern
Common Gull	N	AMBER	Least Concern
Lesser Black-backed Gull	N	AMBER	Least Concern
Herring Gull	Y	RED	Least Concern
Great Black-backed Gull	N	AMBER	Least Concern
Little Tern***	Y	AMBER	Least Concern
Sandwich Tern	N	AMBER	Least Concern
Common Tern	N	AMBER	Least Concern
Roseate Tern	Y	AMBER	Least Concern
Arctic Tern	N	AMBER	Least Concern
Common Guillemot	N	AMBER	Least Concern
Razorbill	N	AMBER	Least Concern
Black Guillemot	N	AMBER	Least Concern
Atlantic Puffin	N	AMBER	Least Concern

* Birds of Conservation Concern in Ireland 3 (Colhoun & Cummins 2013)
** International Union for Conservation of Nature
*** Not currently breeding, historical only
**** NI Priority[2] species are those identified during the preparation of the NI Biodiversity Strategy (2002) and subsequently, using criteria set out by stakeholders.

[2] **http://www.habitas.org.uk/priority/**

Species accounts are structured as follows:

Overview – brief summary of the main breeding sites for the species in Northern Ireland.

Breeding numbers – a summary of current knowledge on breeding numbers in Northern Ireland, with historical trends where data are available, and comparison with UK populations and trends. A detailed summary of data gathered in 2014.

Breeding success – a summary of current knowledge on breeding success in Northern Ireland, with historical trends where data are available, and comparison with UK populations and trends. A detailed summary, where available, of data gathered in 2014.

Surveying methods

Seabird surveys in the UK and Ireland are undertaken using a standard set of survey guidelines for each species (Walsh *et al.* 1995). Tables 2 and 3 briefly outline the survey units used and methods for each species under consideration in Northern Ireland. For further information please refer to Walsh *et al.* (1995).

Table 2 Seabird survey units

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 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 Northern Fulmar.
Apparently Occupied Burrow	AOB	An apparently active and occupied burrow which may have a nest.
Individuals	Ind	Individual birds.

Table 3 Seabird survey methods

Species	Unit	Notes
Northern Fulmar	AOS	Count between 09.00 and 17.30, and 15th May to 5th July. Apparently occupied sites are those ledges suitable for nesting with a bird present.
Manx Shearwater	AOB	Late May to mid-June. Survey using tape playback between 09.00 and 17.00.
Great Cormorant	AON	Count period 15th May to 25th June.
European Shag	AON	Count period 1st May to 25th June.
Great Skua	AOT	Count period late May-June.
Black-legged Kittiwake	AON	Count late May to mid-June. Only count completed nests with at least one adult attending.
All gull species	AON Ind	Count late May to mid-June. Counts of adults on nests, or transects to count nests. Alternatively flush counts of individual adults.
All tern species	AON Ind	Count mid-June. Counts of adults on nests, or transects to count nests. Alternatively flush counts of individual adults.

Table 3 (contd) Seabird survey methods

Species	Unit	Notes
Common Guillemot	Ind	Count between 08.00 and 16.00, and from 1st – 21st June. Birds on tidal rocks or sea excluded.
Razorbill	Ind	Count between 08.00 and 16.00, and from 1st – 21st June. Birds on tidal rocks or sea excluded.
Black Guillemot	Ind	Count between 05.00 and 09.00, and from 26th March to 15th May.
Atlantic Puffin	Ind	Count period April/May or peak numbers at any stage of season. Evening or early morning visits will produce highest counts. Birds on the sea within 200m are counted.

Northern Fulmar *Fulmarus glacialis*

EC Birds Directive – migratory species
Green listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

Northern Fulmars (Fulmars) are one of the commonest seabirds in Britain and adult birds are present in UK waters all year round. Their food comes from a wide variety of sources including zooplankton, fish and fishing discards. 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). Fulmars nest in loose colonies and can utilise relatively small cliff faces, sometimes several miles inland.

In Northern Ireland Fulmars are a widespread breeding species, with the most important site being at Rathlin Island. Other sites are Downhill, Binevanagh, The Gobbins and Muck Island. Small numbers are scattered the whole way round the coast where suitable cliff habitat occurs.

Table 4 Fulmar numbers at sites in 2000 and 2013

Master Site	Site	Seabird 2000 AOS	2013 AOS	2014 AOS	%Change
Downhill	Downhill East	17	13	9	-47
Downhill	Umbra	58	15	5	-91
Downhill	Downhill West	296	91	31	-90
Downhill	Downhill Mid	299	-	344	+15
North Antrim Coast	Portrush sites 1-4	57	26	30	-47
Whitehead	Whitehead 1	25	3	6	-76
Blackhead	Blackhead 1	39	4	3	-92
East Antrim Coast	Ballygalley Head	9	4	6	-33
East Antrim Coast	Sugarloaf Hill	0	0	0	0
East Antrim Coast	Whitebay	10	8	7	-30
East Antrim Coast	Park Head	25	14	16	-36
East Antrim Coast	Galboly	4	3	2	-50
East Antrim Coast	Crearlargh	11	7	4	-64
East Antrim Coast	Caranure	68	7	2	-97
East Antrim Coast	Carrivemurphy	8	0	0	-100
East Antrim Coast	Glenarm Quarry 1	0	0	0	0
East Antrim Coast	Glenarm Quarry 2	0	0	0	0

Breeding numbers

Long term data are available for The Gobbins, Muck Island and Rathlin Island (Figures 1, 2 & 3). For other sites a comparison can be made between Seabird 2000 counts and 2013 and 2014 counts. The Gobbins held 167 AON in 2013 and Muck Island 35 AON. Rathlin Island, in 2011, held 1,518 AON. The UK population increased by approximately 77% and the Northern Ireland population by 58% between 1969-1970 and 1985-1988. Nationally, the Fulmar population then decreased by 3% between 1985-1988 and 1998-2002, while the population in Northern Ireland increased by another 69% (JNCC 2014). Since that date numbers in Northern Ireland have generally decreased (Table 4), a trend also seen across the UK (JNCC 2014).

The species has suffered a near terminal decline on the East Antrim Coast with a reduction of 73% in the last 15 years. A large count of 344 birds was obtained at Downhill in 2014. The reason for this is unclear but may have been due to a large number of young non-breeding birds visiting ledges at the colony on that particular day; in recent years, numbers have not been as high as during Seabird 2000 (Ian Enlander *pers. comm.*). Regular monitoring of study plots at The Gobbins in 2014 showed large variations in numbers of birds attending ledges during the season with presumably pre- and non-breeding individuals involved in these visitations. This highlights the care which must be taken when monitoring seabird populations using just one or two annual counts. Re-surveying this section in 2015 is a priority.

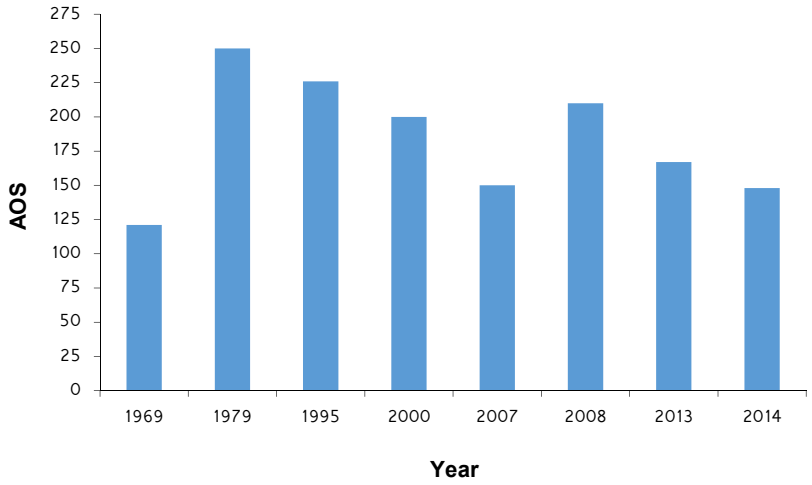

Figure 1 Northern Fulmars at The Gobbins 1969–2014

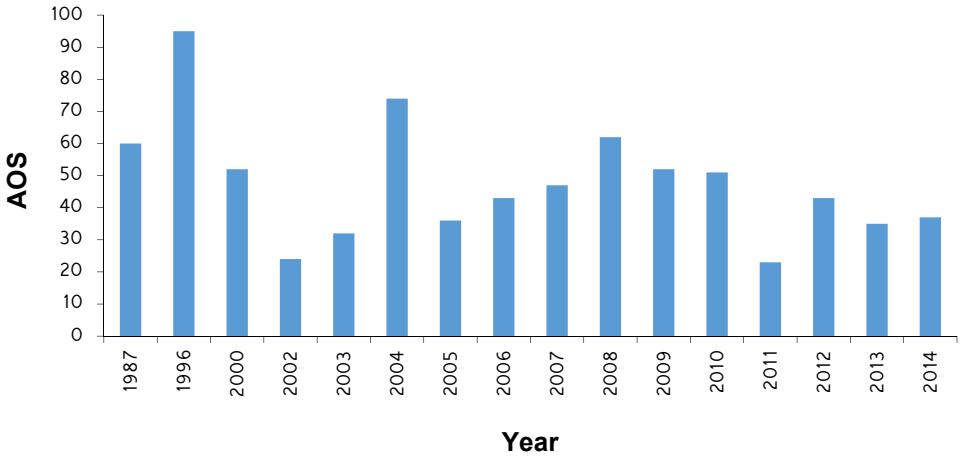

Figure 2 Northern Fulmars at Muck Island 1987–2014

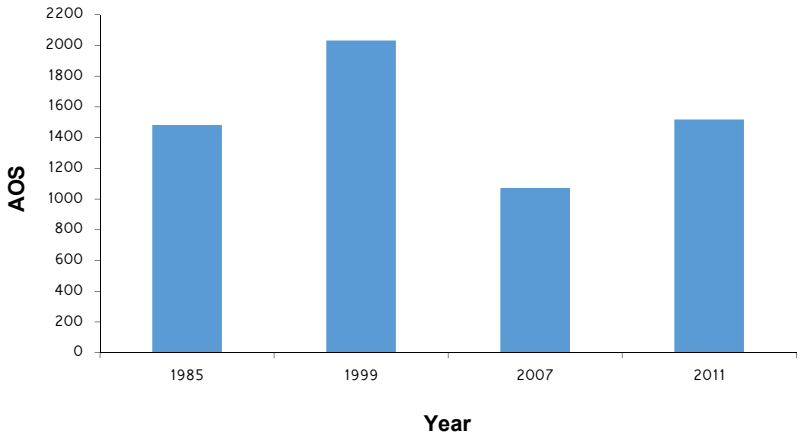

Figure 3 Northern Fulmars on Rathlin 1985–2014

Breeding success

Breeding success data were collected for The Gobbins (29 AOS, 13 chicks, 0.45 chicks/AOS), Portmuck (2 AOS, 1 chick, 0.5 chicks/AOS) and Maggie's Leap (4 AOS, 2 chicks, 0.5 chicks/AOS).

Nationally productivity has been steadily decreasing since 1986 (JNCC 2014). Analysis of the SMP dataset by Cook and Robinson (2010) found that mean breeding success of Fulmars was 0.39 and had declined at a rate of 0.005 chicks per nest per year between 1986 and 2008. This equates to a decline in breeding success of 11%. Using available life history information (population size, clutch size, age at first breeding and survival rates of different age classes) it is predicted that the UK Fulmar population would decline by about 12% over 25 years. In Northern Ireland breeding success appears to be good.

Manx Shearwater *Puffinus puffinus*

EC Birds Directive – migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

Manx Shearwaters are a highly pelagic species and spend most of the year at sea. They nest in burrows, only coming ashore under the cover of darkness to avoid avian predators. Manx Shearwaters became extinct from the eponymous colony on the Calf of Man during the 18th Century, probably due to Brown Rat *Rattus norvegicus* predation (Mitchell *et al.* 2004). However around 100 pairs do now breed on the Calf (Kate Hawkins *pers. comm.*), and a Rat eradication programme is aiming to make the island more suitable for this species (BBC 2012). The largest colony in the world is on the island of Skomer in Wales. Formerly thought to hold around 100,000 pairs at the turn of the century (Smith *et al.* 2001), a new survey in 2011 suggested that the population was approximately 316,000 pairs (Perrins *et al.* 2012).

The only confirmed extant colony in Northern Ireland is on the Copeland Islands, where there are birds on old Lighthouse Island and Big Copeland. Rathlin Island formerly held a colony of unknown size (Brook 1990) but the species has not been confirmed breeding for many years (Liam McFaul *pers. comm.*) and surveys for Seabird 2000 did not detect any birds (Mitchell *et al.* 2004). Deane (1954) estimated 150 pairs on Rathlin but the Operation Seafarer figure was 1,000-10,000 pairs (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, possibly to extinction.

Breeding numbers

The Copeland Islands were last surveyed in 2007 (Stewart & Leonard 2007). At that time there were approximately 4,850 pairs – 3,444 pairs on Lighthouse Island and 1,406 pairs on Big Copeland. This was approximately a 5.3% increase on the previous survey in 2000. However the previous (2000) survey result was within confidence limits of the 2007 population estimate and it is likely there was little change between 2000 and 2007. It is estimated that the colony is now 8-10 times larger than it was in the 1950s. The presence of Rabbits *Oryctolagus cuniculus* on Mew for the last 10 years means it might be expected the species breeds on that island now.

Breeding success

Breeding success has been monitored on Lighthouse Island by Copeland Bird Observatory since 2007, using study burrows. These consist of natural burrows which are excavated outside the breeding season and a concrete slab placed over the nesting chamber to allow easy access. In the seven years of monitoring, breeding success on Copeland has been within the range of other sites, although extremely wet weather in 2007 resulted in a success rate of just 0.38 chicks per pair. No

data are available for 2014. On Rum, in Scotland, the average is approximately 0.70 chicks per pair. On Bardsey and Skomer, in Wales, breeding success varies from 0.55 to 0.80 chicks per pair, though success on Bardsey is higher. If a Manx Shearwater chick hatches the chance of successful fledging is high with most losses during incubation.

Table 5 Manx Shearwater productivity at Copeland Bird Observatory

Year	Nest 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
2014	Not recorded	Not recorded	Not recorded

European Storm Petrel *Hydrobates pelagicus*

EC Birds Directive – listed in Annex 1 and as a migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

European Storm Petrels are highly pelagic, only returning to land to breed. The species has no known breeding sites in Northern Ireland. Ussher and Warren (1900) reported that in relation to breeding in Ireland 'two small islands off the north coast of Antrim are also resorted to'. Deane (1954) reported up to a dozen pairs on Sheep Island, Antrim, but the species is considered unlikely to be still there. It may be present on Rathlin Island but no modern surveys have been conducted. The nearest colony is on Sanda Island which is just 37km to the east. The Skerries, off Portrush, are another potential breeding site. A survey of these locations is long overdue.

Great Cormorant *Phalacrocorax carbo*

EC Birds Directive – migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

Great Cormorants (Cormorant) are a widespread breeding species, often found in dense colonies. In England increasing numbers of Cormorants breed inland, in trees, but this is a trend that has not yet been seen in Northern Ireland. In Northern Ireland, Cormorants have, historically, principally bred at two sites – Sheep Island and Bird Island (Strangford Lough). Smaller numbers are found at The Gobbins, Burial Island on the outer Ards Peninsula and The Skerries, islands offshore from Portrush.

Breeding numbers

Numbers at Bird Island, Strangford Lough, increased erratically until 2005, to a peak of 490 AON (Figure 4). Since then numbers have fallen back to 309 AON in 2014. Numbers at The Gobbins cliffs (Figure 5) have been very erratic in recent years, dropping as low as two AON in 2007, returning to 33 AON in 2008, but have fallen again to six AON in 2014. The colony at Sheep Island has fluctuated in numbers annually but shows an overall decrease since 1985 (380 pairs) to just 95 pairs in 2014. The colony at the Skerries, which held 91 AON in 2014, has been monitored since numbers started to increase (Ian Enlander *pers. comm.*). The colony there has increased as Sheep Island has decreased, so much so that in 2014 Sheep Island was larger by only four pairs. It seems probable that the original population is now spread between the two sites (Figure 6), and interchange with the colony at Inishowen (Co. Donegal) is possible. Overall the population at these two sites has decreased by 54% since 1999.

The UK abundance index for Cormorants for 1986-2013 indicates that the population increased and stayed high until 2005 but has now rapidly returned to 1986 levels. The pattern at The Skerries and Sheep Island reflects this, although the population has now stabilised. Strangford is still well above 1986 levels but the recent rapid decrease will be closely monitored.

Breeding success

Productivity data were collected at The Gobbins, where five nests produced 12 young. UK productivity has declined from *circa* 2.5 chicks/pair in 1992 to under 2.0 chicks/pair in recent years so the productivity at The Gobbins remains good. Surveys are also carried out of Cormorant nests on Sheep Island and the Skerries, although only one visit was carried out in mid-June so final breeding success is unknown. However assuming most chicks counted survived the breeding success for these two colonies would have been approximately 2.0 chicks per AON.

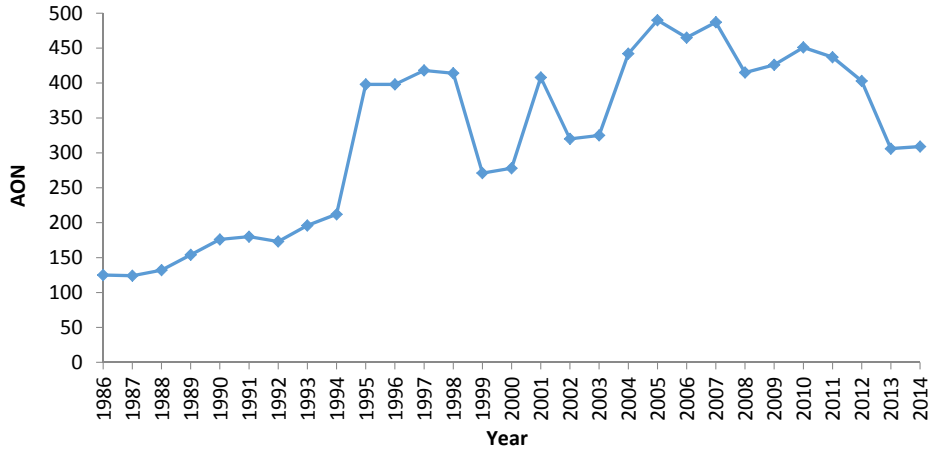

Figure 4 Cormorants at Bird Island, Strangford Lough 1986–2014

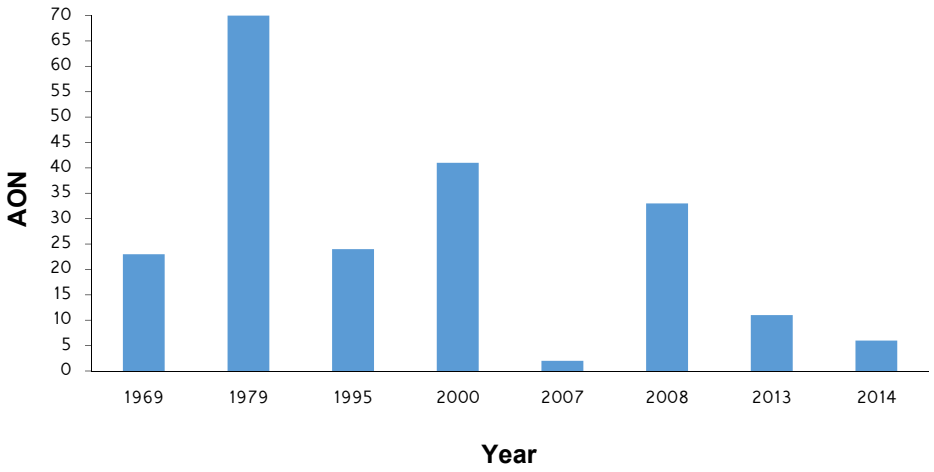

Figure 5 Cormorants at The Gobbins 1969–2014

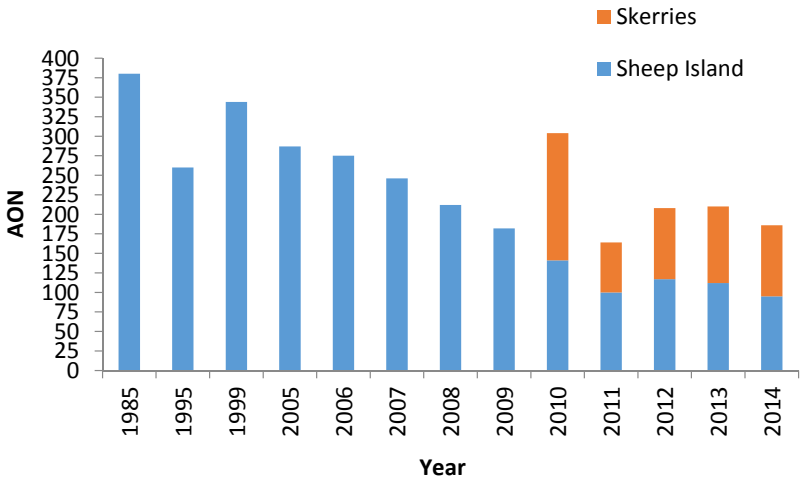

Figure 6 Cormorants at Sheep Island and The Skerries 1985–2014

***Skerries was not surveyed before 2010 as no Cormorants were present**

European Shag *Phalacrocorax aristotelis*

EC Birds Directive – migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

The European Shag (Shag) is endemic to the north-east Atlantic and the Mediterranean. It is a marine inshore species that is almost never observed out of sight of land (Mitchell *et al.* 2004). In Northern Ireland the Shag is a widespread breeding species, 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.

Breeding numbers

The long term trend for Rathlin is downwards with the last survey in 2011 recording 47 AON (Figure 7). At the Maidens there has probably been a slight decrease since 2000, although a proper survey is needed. Numbers at Muck Island and The Gobbins have fluctuated over the long term. In 2013 they were at their highest ever levels but dropped slightly at both sites in 2014 (Figures 9 & 10). Shag stopped breeding in Strangford Lough in 2007 (Figure 8).

The species has been recorded at several new locations since 2013: in 2014 Maggie's Leap to Newcastle held 11 AON and Portrush held two AON. In 2012 a suspected AON was in a cave on Big Copeland. For the UK the JNCC abundance index shows a 51% decline between 1986 and 2013, though this decline has been predominantly in Scotland with populations in England and Wales showing little change (JNCC 2014). Annual return rates of adults are usually in the order of 80-90% (JNCC 2014) but Shags are vulnerable to one off extreme events and the return rate may drop to below 15% as a result of their impact (Frederiksen *et al.* 2008).

Breeding success

The only productivity data collected in 2014 were from Maggie's Leap where five AON produced eight chicks. Productivity at monitored colonies in the UK from 1986-2013 has been approximately 1.0-1.6 chicks/nest, with an average of 1.21 (Cook and Robinson 2010). Population Viability Analysis suggests that if all demographic parameters remain the same (survival, clutch size, *etc.*) the UK population will decline by 9% over the next 25 years.

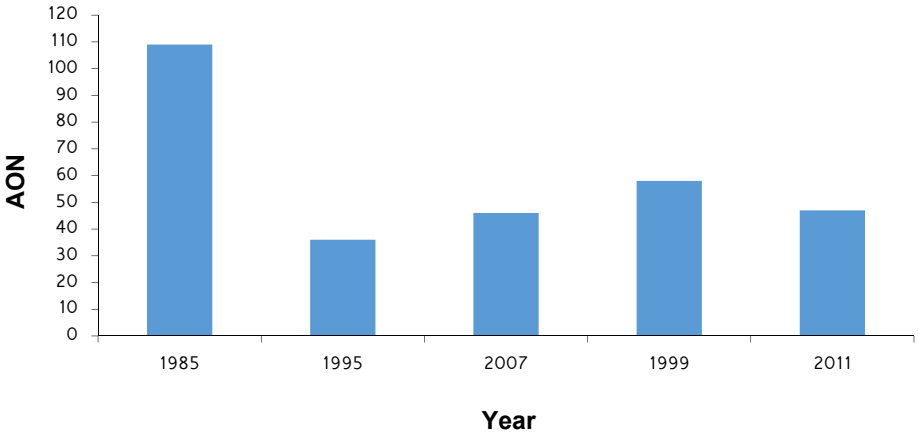

Figure 7 European Shags population at Rathlin 1985–2011

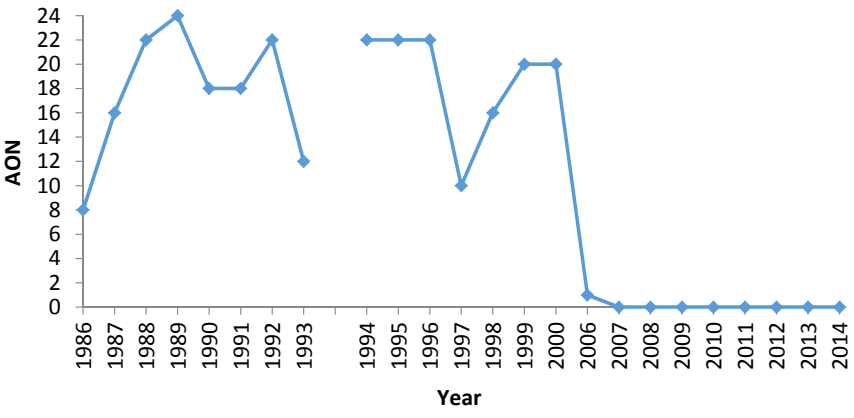

Figure 8 European Shag population at Strangford Lough 1986–2014

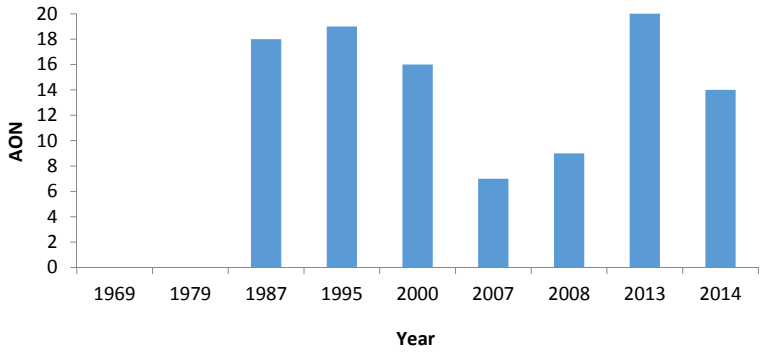

Figure 9 European Shag population at The Gobbins 1969–2014

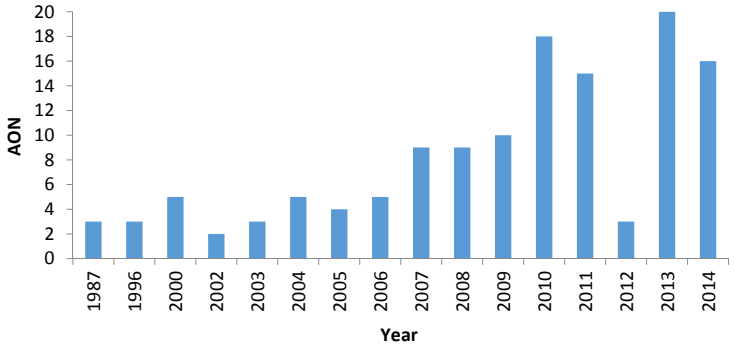

Figure 10 European Shags at Muck Island 1987–2014

Great Skua *Stercorarius skua*

EC Birds Directive – migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

During the Seabird 2000 surveys the UK held 60% of the Great Skua world population. Orkney and Shetland are the core breeding area but the species has now spread through the Western Isles (JNCC 2014). On Orkney the population increased 23% from 2000 to 2010 (Meek *et al.* 2010) and on Fair Isle the number of pairs from 1986-2008 increased from 84 to 294 (JNCC 2014).

In the Republic of Ireland the first breeding occurred in the late 1990s in Co. Mayo (Mitchell *et al.* 2004) and there are now thought to be approximately 15 pairs, although no complete survey has been undertaken (Steve Newton *pers. comm.*). The UK population is healthy and the recent breeding attempts on Rathlin could be considered overdue. Great Skuas have been shown to be serious predators of Leach's Petrels *Oceanodroma leucorhoa* on St. Kilda. This is a potential cause for concern in relation to Storm Petrel populations on islands off the west coast of Ireland (Phillips *et al.* 1999, Votier *et al.* 2006).

Breeding Numbers

On Rathlin a single pair laid eggs in 2010 but they failed to hatch. Presumably the same pair returned in 2011 and again nested, laying two eggs, one of which hatched successfully. The single chick fledged in late summer. This was the first known successful breeding attempt by this species in Northern Ireland. At least five birds were seen around Rathlin in late May 2011 (*pers. obs.*). A pair was present in 2012 but did not breed successfully. In 2013 two adults were present throughout the summer and were joined later by two further birds. In 2014 there was a single pair on Rathlin which bred successfully. At least two further non-breeding birds were present throughout the summer.

Black-legged Kittiwake *Rissa tridactyla*

EC Birds Directive – migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

The Black-legged Kittiwake (Kittiwake) is an oceanic gull which is the most numerous gull species in the world, with the largest UK colonies in Scotland (Mitchell *et al.* 2004). The largest colony, by far, in Northern Ireland is on Rathlin Island, the second largest colony at The Gobbins being only 10% the size of Rathlin. Other small colonies are dotted around the coast at Muck Island, Maggie's Leap, Castlerock, Carrick-a-rede, Dunluce, Strangford Lough, The Skerries and Gun's Island (current status unknown).

Breeding numbers

There are good historical datasets for The Gobbins (Figure 11), Muck Island (Figure 12) and Strangford Lough. In 2014 The Gobbins held 695 AON, a 24% decrease from 2008 and nearly identical to 2013 (694). Muck Island held 251 AON. The Portrush cliffs held 113 AON, a decrease of 56% from 2013. Castlerock was not counted in 2014. At the largest colony, Rathlin, numbers grew from 6,822 AON in 1985 to 9,917 AON in 1999, but in the latest survey (2011) had dropped back to 7,922 AON, a decrease of 20%. At Strangford Lough a peak of 466 nests was reached in 1996 but the species does not now breed anywhere in the Lough. The area from Maggie's Leap to Newcastle held 747 pairs in 2014. Most birds are not visible from the mainland, this is the highest ever count along this stretch of coastline. These birds also had high breeding success in 2014 (see below).

Over the last 6-7 years the three largest colonies in Northern Ireland have shown a decrease of 20-25% but despite this decline the Northern Ireland population is still above 1986 levels. Populations at individual colonies are fluctuating, presumably in response to local feeding conditions. The UK population showed a decline of 72% between 1986 and 2013. In this time the adult return rate at the Isle of May has declined from over 90% to under 70% so the survival of adults may be a key issue for Kittiwake conservation (JNCC 2014). Relative to the overall national trend since 1986, and its historical status, the Northern Ireland population is still reasonably healthy.

Breeding success

Four study plots at The Gobbins were used to determine productivity in 2014. In plot one productivity was 0.44 chicks per pair, in plots two and three it was zero chicks per pair. Productivity in the fourth plot was 0.36 chicks per pair. A boat survey of the entire Gobbins cliff on 25th July (including the above areas) revealed 174 medium to large chicks. This represents an overall productivity of 0.25 chicks/AON. Predation by a mixed pair of Hooded *Corvus cornix* and Carrion *Corvus corone* Crows was extremely high, with constant harassment of nesting individuals and stealing of eggs observed. Crows attacked incubating birds and attempted to pull them off the nest to access the eggs. Kittiwake eggs in particular were found in egg caches on top of the cliff so this seems to be a major factor for local breeding success rates.

The productivity on Muck Island, at 1.31 chicks/AON, was very good. Productivity at Maggie's Leap (0.82 chicks/AON) and Rathlin (0.79 chicks/AON), was also good. The current trend across the UK is for productivity to be rarely over 0.60 and regularly under 0.40 for many colonies (JNCC 2014, Miles 2013).

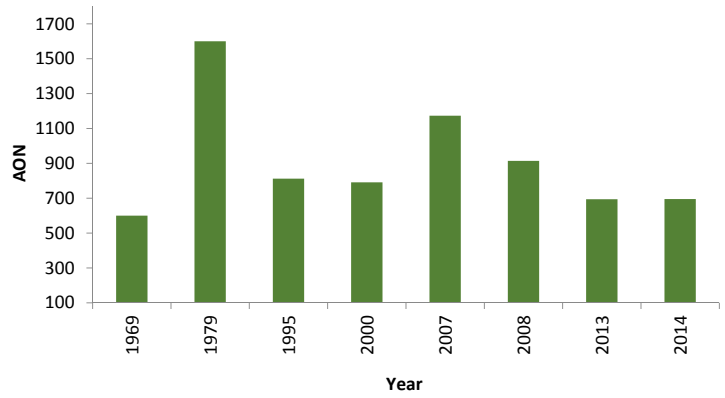

Figure 11 Black-legged Kittiwake at The Gobbins 1969–2014

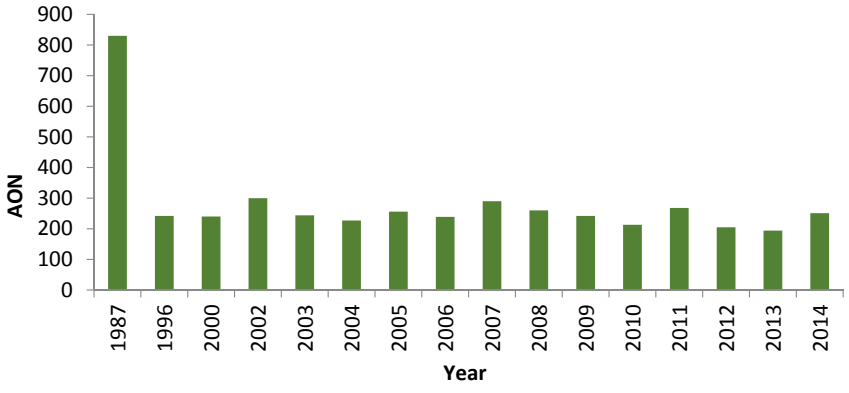

Figure 12 Black-legged Kittiwake at Muck Island 1987–2014

Black-headed Gull *Chroicocephalus ridibundus*

EC Birds Directive – migratory species
Red listed in Birds of Conservation Concern in Ireland 3 (2014–2019)
Northern Ireland Priority species (Northern Ireland Biodiversity Strategy 2002)

Overview

A common breeding species in the UK, with 5.6% of the world population during Seabird 2000. In Northern Ireland a widespread breeding species in relatively few large colonies, with major concentrations at Strangford Lough, Belfast Lough, Larne Lough, Copeland Islands, Lough Neagh and Lough Erne.

Breeding numbers

Breeding numbers at the main sites have fluctuated massively over the last 25 years, even in consecutive years. At Strangford Lough the 2014 count (1,181) represented the lowest since 1986 when annual monitoring began and a slight decrease on 2013. The numbers at Larne Lough grew from just 109 pairs in 1987 to over 2,000 pairs in 2008, but quickly receded. In 2014 the estimated 1,700 pairs represented a 70% increase on 2013 and reinforced the fickle nature of this species. At the Copeland Islands, the 2014 count of 180 pairs was well below the peak of the early 2000s. Figure 13 shows the total population for Cockle Island, Larne Lough, Strangford Lough and the Copeland Islands, 1986-2014, in years where data were available for all four sites. The total population for these major eastern colonies is slightly up from 2013 but still at their lowest over the last 30 years. There are no recent data for Lough Neagh populations except Portmore Lough where 41 pairs bred in 2014.

Breeding success

The only productivity data reported were from Portmore Lough where 1.04 chicks/AON fledged. Despite being on the 2013 BoCCI list, very little productivity data have ever been collected in Northern Ireland. In the UK as a whole productivity fluctuates from 0-1.2 chicks per nest. This pattern of 'boom or bust' is seen frequently in local colonies (*pers. obs.*), with extreme weather, predation and food shortages appearing to be the main reasons for breeding failure. The potential impact of predators such as American Mink *Mustela vison* (Craik 1997) on inland colonies in Northern Ireland are largely unstudied. *Collecting productivity data is a high priority.*

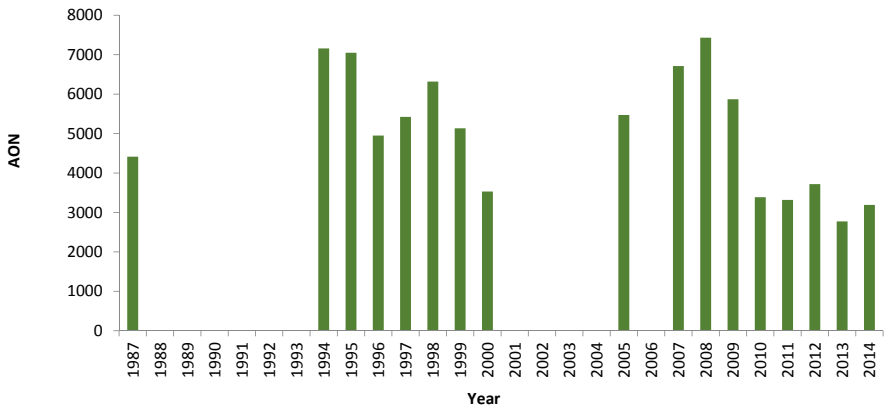

Figure 13 Total population of Black-headed Gulls at Cockle Island, Larne Lough, Strangford Lough and the Copeland Islands, 1986–2014

Mediterranean Gull *Larus melanocephalus*

EC Birds Directive – Annex 1 and migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

The Mediterranean Gull is the most recent addition to the breeding seabird fauna of the UK and Ireland. From just one pair in the 1985-1988 census there were over 100 pairs during Seabird 2000 and there are now well over 1,000 pairs across the UK. Breeding was first proved in Northern Ireland in 1995.

Breeding numbers

After the first breeding in 1995 there have typically been 1-3 pairs annually at three sites in Northern Ireland. This has now increased to 5-7 pairs annually, mostly at Strangford and Larne Loughs, though there has been one pair on Lower Lough Erne in 2012 and 2013. There were seven pairs in Northern Ireland in 2014.

Breeding success

Six pairs were at Larne Lough and one pair in Strangford. An unconfirmed number of young are known to have fledged at Larne Lough. Additionally a male bird was paired with a Common Gull *Larus canus* at Lower Lough Erne. This bird was later seen defending a nest incubated by a Common Gull, although the parentage of the eggs is unknown.

Common Gull *Larus canus*

EC Birds Directive –migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

Scotland held 98% of breeding Common Gulls in the UK during Seabird 2000. In Northern Ireland the species breeds in small numbers around the coast but by far the largest concentrations are on the Copeland Islands and at Strangford Lough. This species has undoubtedly increased since Seabird 2000.

Breeding numbers

Historically the Common Gull was a scarce breeding species which belied its name but from the mid-1990s a steady increase occurred in Northern Ireland, which then accelerated after 2000. The Copeland Islands have not been completely surveyed since 2012 when there were 452 AON, down from a peak of 830 AON in 2009. On Strangford Lough there were 333 AON in 2014, similar to 2013 but down from a peak of 532 in 2010 (Figure 14). No surveying took place in 2001 due to Foot and Mouth disease, no surveying took place in 2006, 2013 and 2014 on Copeland due to time constraints. The pattern of population increase, and subsequent check, at Strangford and Copeland are remarkably similar. Although there may have been some decline in the last few years numbers are still relatively high.

The species has spread around the coast since 2000 with small numbers at many locations, although unfortunately not formally monitored. For example one such new colony was discovered in late July 2013 at Torr Head, Co. Antrim. This was too late in the season to carry out a proper survey but this colony may number 20-25 pairs. 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. It is possible that observed heavy predation by Great Black-backed Gulls *Larus fuscus* is driving this dispersal.

The Northern Ireland trend contrasts with the overall national picture where a modest increase appeared to have occurred between 1986 and 2000, but with a subsequent decline in the abundance index. Northern Ireland still holds relatively modest numbers of this species with the major UK colonies being located in Scotland.

Breeding success

No productivity data were collected in 2013. Intermittent data collected on the Copeland Islands have shown productivity varies from 0.3 to 1.5 chicks fledged per nest each year. In Scotland 0.1-0.7 chicks per nest has been recorded (JNCC 2014). American Mink predation has a large impact at some colonies (Craik 1997).

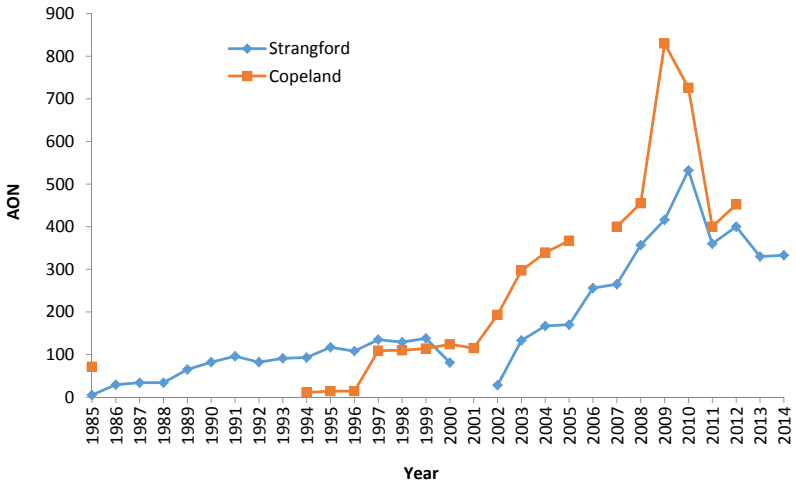

Figure 14 Common Gulls at Strangford Lough and the Copeland Islands 1985–2014

Lesser Black-backed Gull *Larus fuscus*

EC Birds Directive – migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

During Seabird 2000 the UK held 38.4% of the world population. The species breeds across north and west Europe and has increased in numbers throughout its range during much of the 20th Century. Lesser Black-backs nest colonially in a wide variety of places including islands and roofs. The Lesser Black-backed Gull is a widespread breeding species in Northern Ireland, mainly in a few large colonies at the Copeland Islands, Strangford Lough, Lower Lough Erne and Lough Neagh. There are smaller numbers at Rathlin Island, The Skerries and Muck Island. Roof nesting is widespread in Belfast and there is also a colony in Antrim town. This practice is unrecorded in the rest of Northern Ireland and other records would be welcome.

Breeding numbers

Strangford Lough had 438 AOT and Lower Lough Erne over 904 AOT in 2014. In Northern Ireland the Lesser Black-backed Gull has shown a large population increase since Seabird 2000, particularly in the last 6-7 years. This increase is very apparent at the Copeland Islands and mirrored at Strangford Lough and Lower Lough Erne. Since Seabird 2000 the combined population for these three sites has increased from 798 AOT to 1,883 AOT by 2012. No full count was undertaken on the Copeland Islands in 2014 but there were approximately 1,009 AOTs in 2012, up from just 420 AOTs in 2005. This is probably lower than the actual number of pairs as the common practice of dividing the number of individuals present by two, in order to arrive at the number of AOT (Walsh *et al.* 1995), probably greatly underestimates the population. There are no up-to-date count data for Lough Neagh and the last survey there was in 2000. As a matter of priority a count of all Lough Neagh colonies is needed to ascertain the complete status of the species in Northern Ireland.

The JNCC abundance index for the UK population indicates that the UK population increased up to 2000 but has since decreased and is now at 1986 levels. The available evidence shows this is in marked contrast to the Northern Irish population which has continued to increase since 2000.

Breeding success

Productivity surveys on two islands at Lower Lough Erne showed 1.2 chicks/AON and 1.4 chicks/AON fledged respectively.

Herring Gull *Larus argentatus*

EC Birds Directive – migratory species
Red listed in Birds of Conservation Concern in Ireland 3 (2014–2019)
Northern Ireland Priority species (Northern Ireland Biodiversity Strategy 2002)

Overview

Common breeding species with concentrations at the Copeland Islands and Strangford Lough. Smaller colonies on Rathlin Island, Burial Island, Muck Island and The Skerries.

Breeding Numbers

Herring Gulls suffered a well-publicised catastrophic decline in the late 1980s, probably largely as a result of botulism (Mitchell *et al.* 2004). For example the population of Rathlin declined from 4,037 AOTs in 1985 to just 19 AOTs in 1999 (Mitchell *et al.* 2004). A similar decline occurred on the Copeland Islands, from approximately 7,000 pairs in 1985 to 225 pairs in 2004. The figures for Strangford Lough (Figure 15) mirror this trend, with a massive and rapid decline in the mid-1980s, followed by the crash and a low point reached just after the turn of the century. Since 2007 both sites have shown sustained growth in AOTs. Across the UK the decline was not as severe and there was even a small recovery in the 1990s, although populations are declining again (JNCC 2014), in contrast to Northern Ireland where populations have been modestly increasing. If existing UK demographic parameters (survival, clutch size, *etc.*) remain the same then a 60% decrease in national population is predicted over the next 25 years (Cook and Robinson 2010). Most Herring Gulls breed on offshore islands which are difficult to survey and there is little recent population data.

Breeding success

No data on productivity were gathered in 2014.

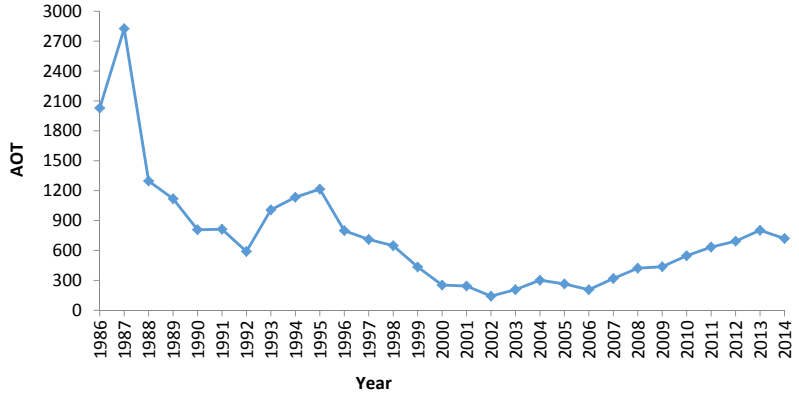

Figure 15 Herring Gulls at Strangford Lough 1986–2014

Great Black-backed Gull *Larus marinus*

EC Birds Directive – migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

The JNCC abundance index for Great Black-backed Gull indicates that the population increased from the 1980s into the 1990s but has since decreased steadily so that the index is at its lowest point in the period 1986-2013 (JNCC 2014). The most important site in Northern Ireland, by far, is on Great Minnis's Island, Strangford Lough (Figure 16). 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 (*pers. obs.*). The third most important site is Carlingford Lough but numbers are low.

Breeding numbers

Strangford Lough held 82 AONs in 2014. This represents a 20% decrease from a record in 2013 back to the level of 2012. Since 1986 the UK abundance index has fluctuated but recently has started to drop steadily. Three pairs nested at Lower Lough Erne.

Breeding success

Two pairs at Maggie's Leap, one pair fledged two young. Two pairs on Lough Erne fledged one chick each. A pair at Larne Lough was unsuccessful. Monitoring across the UK has shown that productivity dropped since the early 2000s and this may, in part, be responsible for population declines.

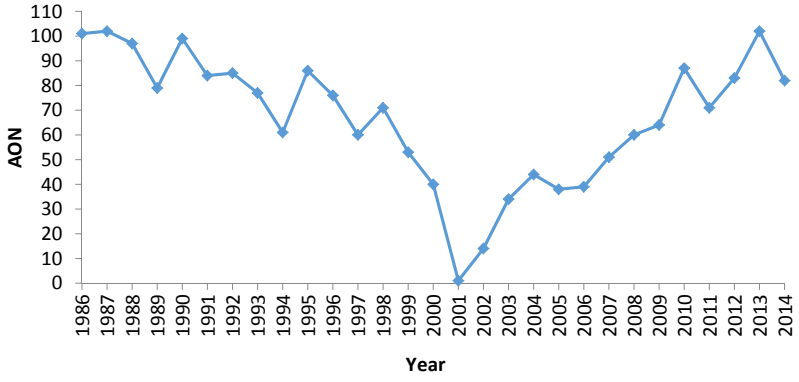

Figure 16 Great Black-backed Gull populations at Strangford Lough 1986–2014

Little Tern *Sternula albifrons*

EC Birds Directive – listed in Annex 1 and as a migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)
Northern Ireland Priority species (Northern Ireland Biodiversity Strategy 2002)

Overview

This is the smallest species of tern breeding in the UK, nesting exclusively on the coast usually on beaches. They do not forage far from their breeding site. On the island of Ireland the main breeding concentrations are on the south and east coast. In Northern Ireland it has always been a rare breeding species and has not been reported nesting since 1996 when two pairs were present at Bird Island, Portavogie.

Sandwich Tern *Sterna sandvicensis*

EC Birds Directive – Annex 1 and migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

The UK holds approximately 8% of the world population of Sandwich Terns. Census data indicate that the UK population increased by 33% between 1969-1970 and 1985-1988, but that numbers then declined by 15% in the period between 1985-1988 and 1998-2002. The JNCC abundance index indicates that numbers are now similar to those in 1986 but numbers can fluctuate greatly from year to year (JNCC 2014). There has been a long term decline in breeding success (JNCC 2014). In Northern Ireland most breed in a few large colonies at Strangford Lough, Larne Lough and Lower Lough Erne.

Breeding numbers

The three largest colonies are in the east: Cockle Island, Groomsport; Strangford Lough; and Larne Lough. Sandwich Terns formerly bred at Carlingford Lough before abandoning the site, but in 2014 76 pairs bred. This is the first successful breeding since 2010. Figure 17 shows the cumulative annual Sandwich Tern population for these four sites each year since 1969, the total was 1,630 pairs in 2014. This was a 31% increase on 2013 but still 52% lower than the peak in 2005. The highest ever population was in 2005 but a steep decline has occurred since then. On Gravel Ridge Island, Lower Lough Erne, there were 124 pairs which was the highest count since 1995.

Sandwich Tern has the most complete monitoring record over the longest period of any seabird species in Northern Ireland.

Breeding success

Breeding success has been monitored intermittently at Lower Lough Erne since 1990. The success rate has rarely been greater than 0.5 chicks per nest and usually much lower (B. Robson *pers. comm.*). At Carlingford Lough 0.66 chicks/AON fledged.

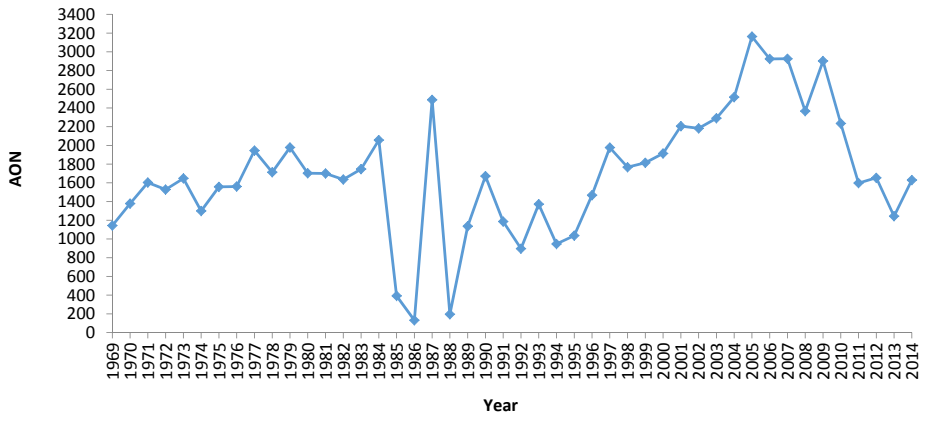

Figure 17 Cumulative Sandwich Tern populations at Cockle Island, Strangford, Carlingford and Larne Lough 1969–2014

Common Tern *Sterna hirundo*

EC Birds Directive – listed in Annex 1 and as a migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

Across the UK the population remained steady from 1986-2006 but since then there has been a decline with the JNCC abundance index now 13% below that of 1986 (JNCC 2014). Although the reasons for this are unproven there has been a decrease in breeding success in the last ten years (JNCC 2014). Common Terns are the most widespread breeding tern species in Northern Ireland with coastal and inland populations. Significant numbers breed at several sites on Lough Neagh but these are poorly monitored. The main coastal sites are Strangford Lough, Larne Lough and Belfast Lough.

Breeding numbers

Historical data for the main colonies are incomplete. In the late 1960s the total population was probably 5-600 pairs. In the late 1980s there was a sudden increase to over 1,000 pairs and, by the early 21st Century there were over 2,000 pairs. Since this peak the population has again declined and numbers are now similar to the late 1980s (Figure 18). The current population for the four main east coast colonies is just above the average for the recording period 1980-2013. National surveys and the JNCC abundance index indicate that the UK population as a whole has remained stable (JNCC 2014) over the long term.

The cumulative total for the main eastern colonies are shown in Figure 18. Unfortunately no recent data have been gathered on Lough Neagh so it is not possible to determine how the population there has changed and a survey of those colonies is urgently needed. In 2014 a maximum of 26 AON were located on Lower Lough Erne. There was a peak count of 90 AON on the nesting raft at Portmore, on 13th June. Belfast Lough RSPB reserve had a peak of 287 AON. No data were available for the Copeland Islands in 2014.

Breeding success

In 2014 terns at Belfast Harbour RSPB produced 0.65 chicks per pair (C. Sturgeon *pers. comm.*). There was a peak count of 127 fledged young at Portmore on 9th July, 1.41 chicks/AON (D Black *pers. comm.*). Productivity data for Common Terns in Northern Ireland shows they had an average fledging rate of 0.32 chicks per pair between 1999 and 2011 (JNCC 2014).

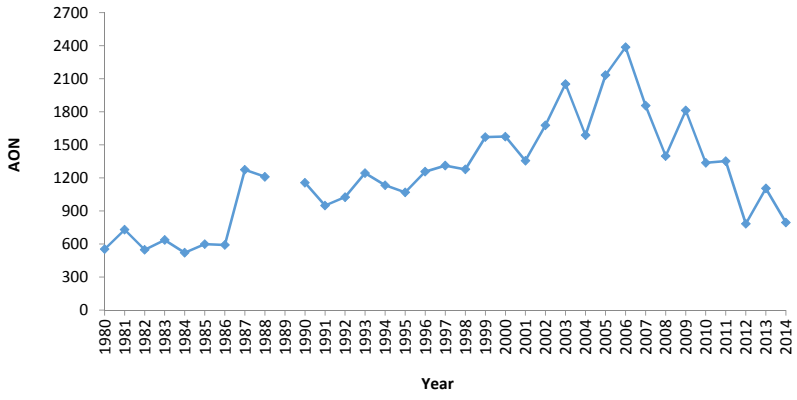

Figure 18 Cumulative Common Tern populations at Cockle Island, Strangford, Carlingford, Copeland Islands, Belfast Lough and Larne Lough 1980–2014

Roseate Tern *Sterna dougallii*

EC Birds Directive - listed in Annex 1 and as a migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)
Northern Ireland Priority species (Northern Ireland Biodiversity Strategy 2002)

Overview

European populations of the Roseate Tern declined during the 20th Century, a decline which was mirrored by population declines in North America (del Hoyo *et al.* 1996). Numbers stabilised in the late 20th Century and while some European populations have continued to decline other colonies have increased, with focused conservation measures helping this recovery (Newton and Crowe 2000). The Roseate Tern in fact has a worldwide population and occurs in the Atlantic, Indian and Pacific oceans with populations in places such as Australia and east Africa. This fragmented population could make the species vulnerable to local population declines and extinctions.

In Scotland the main colony at the Firth of Forth appears to have been extirpated, partly due to a growth in the local Herring Gull population (JNCC 2014). The only colony in England, on Coquet Island, has increased slowly this century but still has a population under 100 pairs. It may have benefited from emigration from other sites. The stronghold for the species within these islands is now in south-east Ireland at Rockabill Island and Lady's Island Lake. 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).

Breeding numbers

The species is all but extinct in Northern Ireland having suffered a near-terminal decline in the late 1980s (Figure 19). In 2014 there was a slight increase from one to at least two, and maybe three pairs. Two birds were seen displaying in Carlingford Lough but no breeding occurred.

Occasional birds turn up at other colonies. For example in 2012 there were several sightings around the Copeland Islands and up to two birds were present on Cockle Island in Groomsport (*pers. obs.*), but breeding was not proven. In 2008 a pair was present at Belfast Harbour RSPB reserve, utilising a nesting box on the specially constructed tern rafts, though the birds did not breed. If breeding habitat can be maintained or improved it must be anticipated that excess birds from the Rockabill colony on Co. Dublin will use Northern Irish sites.

Breeding success

The fledging of at least two chicks was probable, though not certain as it is very difficult to find and confirm fledged flying young in the dense gull and tern colony.

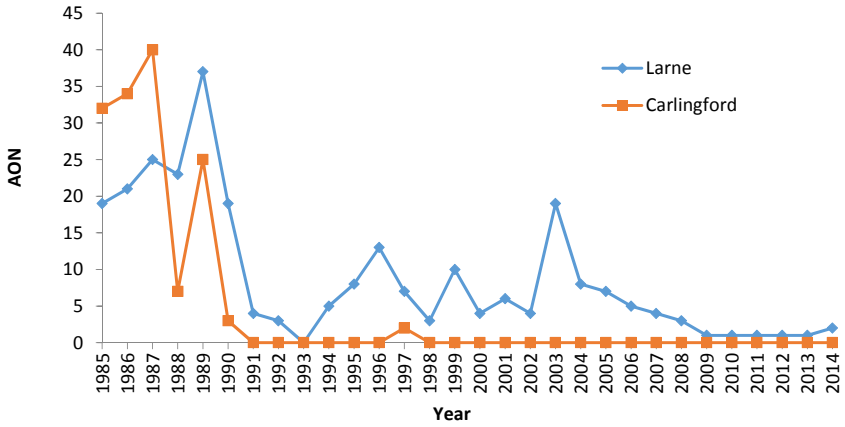

Figure 19 Roseate Tern populations in Northern Ireland 1985-2014

Arctic Tern *Sterna paradisaea*

EC Birds Directive – listed in Annex 1 and as a migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

Arctic Terns are the commonest tern breeding in the UK. The UK population has fluctuated greatly since the 1960s. There was an apparent large increase between 1969 and 1986, though there is uncertainty of the true magnitude of this change due to questions of compatibility of methods between censuses. The Arctic Tern UK abundance index based on the SMP sample showed an apparent rapid increase, followed by decrease, during 1986 to 1990. From 1990 the index has fluctuated, mainly above 1986 levels (JNCC 2014). The majority of the UK population nests in the Northern Isles, with 73% occurring there. In Northern Ireland the species is concentrated into just a few colonies with the largest of these currently on the Copeland Islands.

Breeding numbers

Strangford held just 196 AONs, Cockle Island 174 and Belfast Harbour 33 AONs. No full survey took place on the Copeland Islands.

In the last 25 years the Copeland Islands and Strangford Lough have held the majority of breeding birds in Northern Ireland. The population at Copeland has fluctuated between 600 and 1,250 pairs since 2000. Between 2008 and 2012 the populations of these sites decreased, but on Copeland the population stabilised at approximately 750 pairs. At Strangford the decrease was 90%. The reduction in the Strangford population during this period was not accounted for by an increase in other local colonies at the same time. Overall the Northern Ireland population remains very healthy (Figure 20). No surveying was carried out in 2001 due to Foot and Mouth disease.

Breeding success

At Belfast Harbour RSPB Reserve no chicks were fledged.

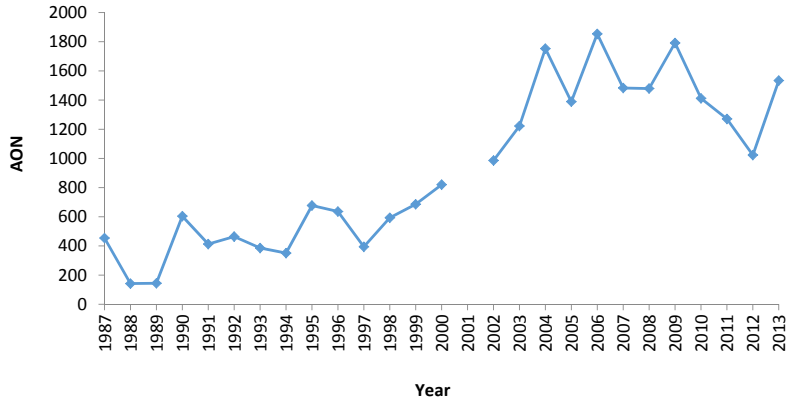

Figure20 Arctic Tern populations at Copelands, Strangford, Belfast Lough and Cockle Island colonies 1987-2013

Common Guillemot *Uria aalge*

EC Birds Directive – migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

The Common Guillemot (Guillemot) is one of the most abundant seabirds in the northern hemisphere. There are very large populations in the Atlantic and Pacific Oceans. Guillemots are extremely gregarious and colonies can contain many tens of thousands of individuals (Mitchell *et al.* 2013). 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.

Breeding numbers

The last full survey of Rathlin, in 2011, recorded 130,445 individuals (Allen *et al.* 2011). After a 50% decrease between 1999 and 2007 this was a 60% increase which probably makes Rathlin the largest colony in the UK and Ireland.

In 2014, 1,510 individuals were recorded at The Gobbins and 1,745 individuals at Muck Island (Figures 21 and 22). Numbers at Muck were similar to 2013 but The Gobbins figure represents a 28% decrease from 2013. Guillemots are extremely difficult to census accurately as they show large daily variations in attendance, and of all the cliff nesting species they show the highest variation (Leonard 2014). The decrease at The Gobbins does at first seem alarming but may have simply been a day when larger numbers of birds were offshore feeding. Alternatively there may have been fewer non-breeding birds present, the number of which is always an unknown quantity.

Overall recent figures suggest the Guillemot population in Northern Ireland is very healthy. This correlates well with the JNCC abundance index which suggests that across the UK Guillemots are approximately 50% more common than in the 1980s (JNCC 2014). However the increase at Rathlin is in contrast to Handa, the largest colony during Seabird 2000. The Guillemot population there has decreased by over 50% (JNCC 2014). Studies on the Isle of May have shown that Guillemot adults have a 90% annual return rate (JNCC 2014), but this was much lower in 2007-2008, which may give clues to the reasons for the low count on Rathlin in 2007.

Breeding success

Guillemot breeding success is difficult to assess accurately but a productivity survey at The Gobbins revealed very low breeding success with less than 0.15 chicks per nest fledged (*pers. obs.*). Hooded and Carrion Crows were responsible for the predation of many Guillemot eggs at The Gobbins while Great Black-backed Gulls predated adults. Across the UK productivity has decreased slowly since the 1980s, with the pace of decrease becoming more rapid after 2000. Between 2002 and 2007 just 0.3 chicks per pair were fledged. Levels of productivity have recovered slightly since 2007 but are still

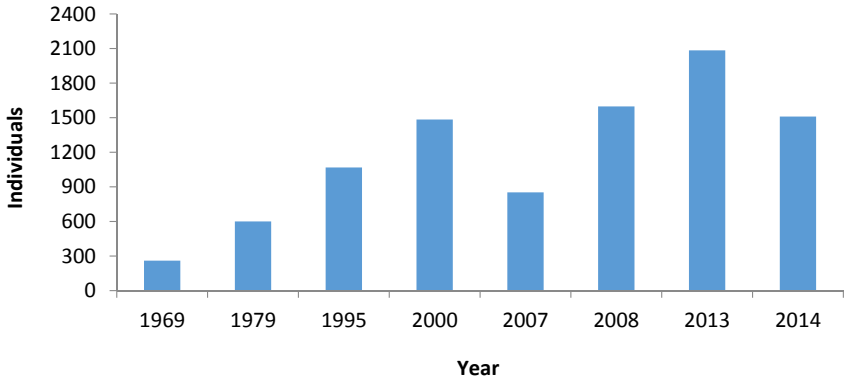

Figure 21 Common Guillemot populations at The Gobbins 1969–2014

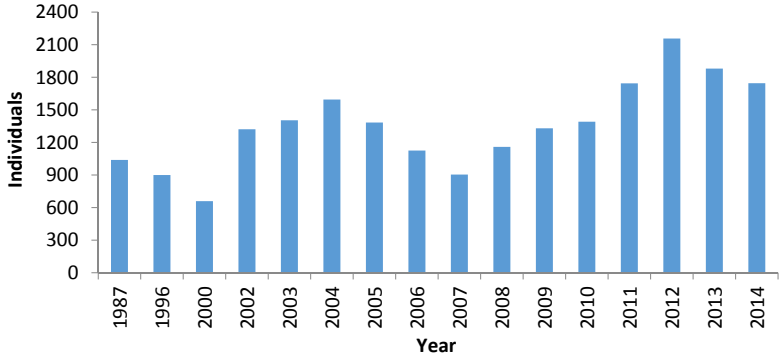

Figure 22 Common Guillemot populations at Muck Island 1987-2014

Razorbill *Alca torda*

EC Birds Directive – migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

The Razorbill is a bird of the North Atlantic and Arctic Ocean. Razorbills nest on ledges with Common Guillemots but also frequently in clefts, holes and under boulders. 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.

Breeding numbers

The last full survey of Rathlin, in 2011, recorded 22,975 individuals. This was double the figure recorded in 2007, but only 10% above the 1999 total. Rathlin is probably now the largest colony in the UK and Ireland.

The 2013 population at The Gobbins (240 individuals) was one of the lowest ever recorded, close to 2008 levels, and represented a 72% decrease from the record year of 2013 (Figure 23). The count at Muck Island (402 individuals) represented a 54% decrease from 2013 (Figure 24). Why this large decrease? It seems probable that large numbers of birds did not breed in 2014, and that numbers of pre-breeding visitations were down. Monitoring of productivity plots at The Gobbins throughout the spring showed that the numbers of birds present fluctuated daily, on the day of the full survey there were only one third of the maximum count present (Leonard 2014). Numbers fluctuated throughout the entire summer with relatively few ledges and holes actually holding breeding birds. A boat trip along the entire cliff in early July (before fledging) resulted in a count of just 55 adult birds. Clearly it was a poor year for Razorbills breeding on this section of coast.

The JNCC abundance index has fluctuated over the last 25 years but is still well above 1980s levels.

Breeding success

Across the UK annual productivity has declined slowly over the last 25 years and is now approximately 0.5 chicks per pair. No data are available for Northern Ireland in 2014.

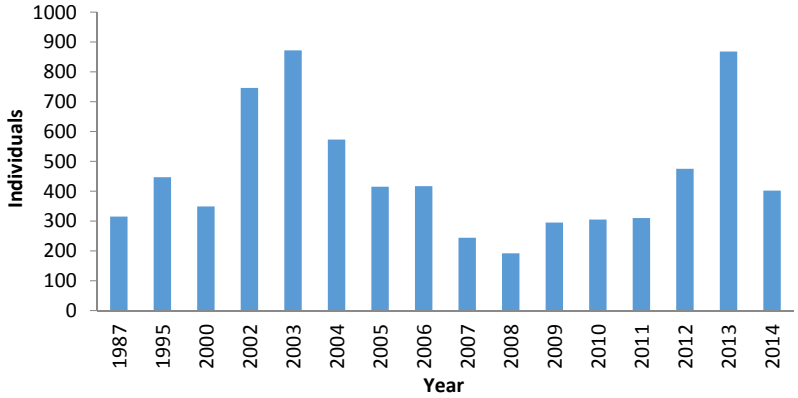

Figure 23 Razorbill populations at Muck Island 1987–2014

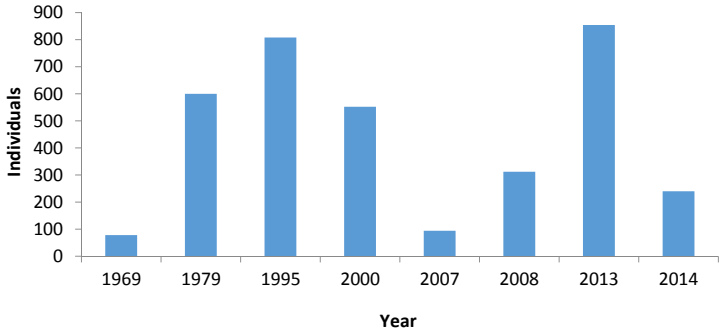

Figure 24 Razorbill populations at The Gobbins 1969–2014

Black Guillemot *Cepphus grylle*

Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

The Black Guillemot is a circumpolar species which in the UK has historically been a predominantly Scottish species. Between censuses in 1969-1970 and 1985-1988 there was a range expansion and the species increased dramatically around the coast of Northern Ireland (JNCC 2014). This increase continued through Seabird 2000 to this day. Black Guillemots nest in crevices (natural or man-made) and can be difficult to survey. It is essential the recommended methodology is followed.

Breeding numbers

The sites counted by surveyors in 2014 held approximately 80% of the population at Seabird 2000. The total population across these locations was well down in 2014 for the Co. Down coast (Annalong -70% and Newcastle coast -65% from 2013). The counts at these sites were a little later but well within the prescribed period, and it is known that significant disturbance of nesting sites took place at Newcastle, and possibly at Annalong. It is probable this is the reason for the lower counts in 2014. In contrast a full count of Belfast Harbour revealed 122 birds, Glenarm Harbour had a record 72 birds and Larne Lough a record 125 birds.

Black Guillemots, like other seabirds, show a high degree of philopatry once they start to breed (Brooke 1990), but juveniles will disperse readily to other colonies (Frederiksen & Peterson 2000). Increased juvenile dispersal away from poorer sites, coupled with poorer adult survival but better survival for Co. Down birds, could be responsible for these changes. However, we simply do not know for sure. Black Guillemots in Northern Ireland feed almost exclusively on the Butterfish *Pholis gunnellus* (*pers. obs.*) and the distribution and abundance of this species must be a key factor influencing Black Guillemot populations and distribution.

Breeding success

In 2014 the Bangor colony had 33 pairs which fledged 0.97 per pair (Julian Greenwood *pers. comm.*).

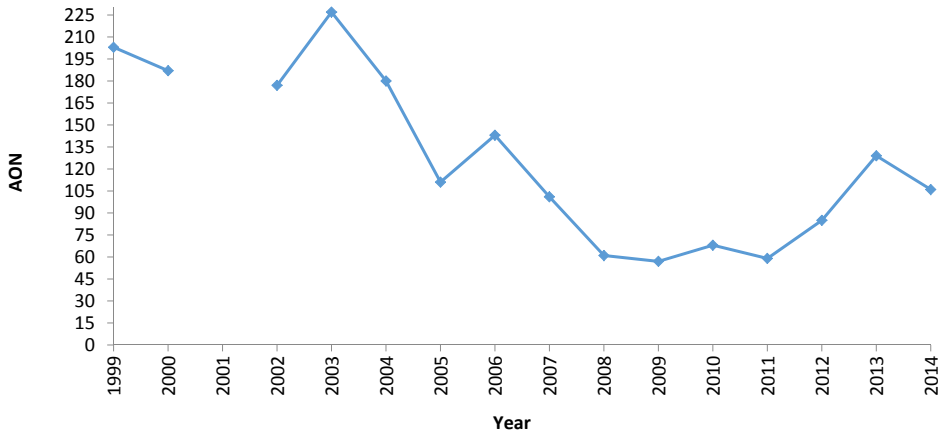

Figure 25 Black Guillemot populations at Rathlin

Atlantic Puffin *Fratercula arctica*

EC Birds Directive – migratory species
Amber listed in Birds of Conservation Concern in Ireland 3 (2014–2019)

Overview

The Atlantic Puffin is the most instantly recognisable of all North Atlantic seabirds. They are a secretive bird on land, nesting in burrows, and we also know relatively little about their pelagic lifestyle. This is however changing with the use of new technology (Harris *et al.* 2010; Guilford *et al.* 2011). Around 10% of the world population breeds in the UK and Ireland, where it is the second most abundant breeding seabird (Mitchell *et al.* 2004).

In Northern Ireland the main colony is on Rathlin, with small numbers at The Gobbins. Some are occasionally seen at Muck Island although breeding has not been confirmed. A conservation project on the Copeland Islands is attempting to create a new colony using decoys and sound lures.

Breeding numbers

In 2014 a peak count of 54 was recorded at the Gobbins, a similar count to 2013 (Leonard 2014). Birds were present around Lighthouse Island, Copeland Islands, during June, though numbers were much reduced from 2013.

Breeding success

There are no productivity data available for Northern Ireland. Research in the UK has shown that productivity is highly variable between 0.3 and 0.8 chicks per pair.

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Strangford Lough - Seabird Predation Report 2014

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Background

Predation of eggs and chicks occurs at all of the breeding seabird colonies on Strangford Lough, to a greater or lesser degree. This is part and parcel of seabird ecology and is accepted as such. However if particular colonies or species appear to be suffering significant losses year on year then some form of intervention must be considered. Predation has been observed at other seabird colonies in Northern Ireland. On the Copeland Islands alone Hooded Crow *Corvus cornix*, Jackdaw *Corvus monedula*, Raven *Corvus corax*, Peregrine Falcon *Falco peregrinus*, Kestrel *Falco tinnunculus*, Herring Gull *Larus argentatus*, Lesser Black-backed Gull *Larus fuscus*, Great Black-backed Gull *Larus marinus*, Common Gull *Larus canus* and European Otter *Lutra lutra* have been recorded predating seabird species such as Arctic Tern *Sterna paradisea*, Manx Shearwater *Puffinus puffinus*, Shag *Phalacrocorax aristotelis*, Black Guillemot *Cepphus grylle* and all gull species (Leonard 2005, Leonard & Wolsey 2011, Leonard & Preston 2013). At The Gobbins Hooded Crows predate Common Guillemot *Uria aalge*, Razorbill *Alca torda* and Kittiwake *Rissa tridactyla* eggs (Leonard 2014) while Peregrine Falcons predate adult birds. Great Black-backed and Herring Gulls have been responsible for the complete breeding failure of breeding terns at Green Island, Carlingford Lough (Shane Wolsey *pers. comm.*).

Historically the National Trust has undertaken predator control where it was felt necessary, for example Herring Gulls were controlled in the Mid-Lough islands and Jackdaw Island in 1988 due to concerns over their increasing numbers and perceived threat to a nationally important colony of Sandwich Terns. Great Black-backed Gulls have been controlled under licence on selected islands from 2010 where they have been considered to be a threat to breeding terns. Brown Rats *Rattus norvegicus* (Rats) are prevalent on many of the islands particularly in the Mid-Lough. European Otters (Otter) use a number of the islands as holts or for accessing fresh water and Peregrine Falcons can impact on some colonies in some years. There is also of course intra and inter specific predation by all gull species. As well as the threat of predation the Lough's seabirds also have to contend with the vagaries of the weather and tides. Spring tides that coincide with low pressure and strong onshore winds can result in 'wash-outs' where nests get swamped. This can have a significant impact at the incubation stage particularly for Common Tern *Sterna hirundo* and Arctic Tern.

When predation levels have been considered to be insignificant, localised or transient then intervention has not been deemed to be justified. Where control measures have been justified there has been a specifically identified need and a confidence in the efficacy of the method, and in these circumstances measures have been undertaken. For example Rat bait has been deployed on Swan Island in most years where the size of the island means that the presence of rats can easily be established and if present they can be easily targeted *i.e.* the removal of the predation threats should be achievable. There is confidence in the successful outcome of the control measure. Again on Swan Island, in one breeding season electronic animal scarers were used after significant egg losses were put down to Otter predation, this was only deemed to be an option because of the small size of the island.

In recent years there has been increasing concern that mammalian predation has been occurring at key colonies, and that this predation may be the driver of population decreases. The presence or absence of rats and an approximate indication of their abundance is recorded on every island during the seabird monitoring season. There would appear to be a close correlation between the presence of Rats and the absence of terns and Black-headed Gulls although this may be partially or wholly attributable to habitat selection. Since 2001 the appearance of predated eggs and chicks has not however always been consistent with Rat predation. The majority of egg predation has been attributed to mustelids and gulls. Some predation of adult terns has been attributed to Peregrines but chick predation is largely by a mammalian ground predator other than the Rat.

Coastal erosion at historically significant breeding sites is also of concern particularly in the north-east of the Lough where vegetated islands have now become un-vegetated boulder shore or shingle bars. These are very vulnerable to high tides in certain weather conditions. Wash-outs of nests are becoming more frequent, and there has been a significant loss of nesting habitat with islands such as the Chanderies, Turley Rock and notably the Sheelah's becoming almost unusable as breeding sites. With the Lough's breeding seabirds facing this pressure and with specific concern about the recent decline in Arctic Tern and Common Tern it was felt that there was a real need to gather more detailed information about the predation threat, particularly with regard to American Mink *Neovision vison* (Mink).

Methods

It was decided to focus fieldwork on gathering evidence of disturbance and potentially of predation at a limited number of breeding colonies, through the deployment of motion sensor cameras. Although these cameras might shed some light on predation, this would principally be assessed through the analysis of predated eggs, chicks and other field signs. Given limited

resources it was decided to target two of the key tern colonies, with one camera being deployed on Black Rock off Ringdufferin and two on Dunsy Rock off Ringhaddy. The cameras were orientated and programmed to detect disturbance from within, above and on the periphery of each island. The remains of predated seabird chicks were collected throughout the monitoring season as were samples of all predated eggs, including those of wildfowl. The results of the motion sensor camera work are the subject of another report. This report focuses specifically on predation.

In the case of predated eggs, bite hole shape and size were used to indicate the probable predator species. Gull attacks often caused long and narrow incisions, while mustelid bites took more ovate forms. Mustelid species were identified through the presence of canine puncture holes in the egg shells, with the spacing between canines being indicative. Inter-canine spacing for Otter was expected to fall in the range of 23.9-30.3mm (Lynch & O'Sullivan 1993), for Mink 11.0-16.1mm (Kruska & Sidorovich 2003), and for Pine Marten 14.4-18.7mm (Reig & Ruprecht 1989). In the absence of canine punctures, bite hole size was used, with a maximum bite size determined for Otter and Mink using published morphological studies (Ansorge & Stubbe 1995; Kruska & Sidorovich 2003). Rat predation was apparent due to a 'gnawed' appearance of the shell opening (Austin 1948).

Results

MID LOUGH

Inishanier (J549616)

Two predated Eider *Somateria mollissima* eggs were recovered from Inishanier. These were found within close proximity to one another and were also found near what is believed to be an Otter holt. The bite marks are consistent with mustelid predation, as both were bitten along the long axis. The hole size of egg #002 was within the range expected of an adult Otter jaw, while egg #001 had a hole size which was larger than the maximum expected size of a Mink jaw, but smaller than that of a small adult Otter. Given the data available, it is not unreasonable to conclude that this egg was depredated by a juvenile Otter.

Drummond (J552609)

Drummond was found to be an island where intra-gull predation was occurring, with evidence of Lesser Black-backed and Herring Gulls opportunistically destroying the eggs of other gulls nesting nearby. Three Lesser Black-backed/Herring Gull eggs were found that were clearly depredated by other gulls.

There was also an Eider egg discovered (#007) that showed the characteristic narrow incision expected from a gull attack, but it also had a large round hole on the long axis, which is more in keeping with a mustelid attack. It is probable that there was initially a large gull attack, as the narrow incision is relatively long and broad, with a Mink subsequently claiming the egg for food. The round hole on the long axis is within the range of Mink jaw sizes. A final egg, belonging to a Common Gull was found (#011). This showed clear signs of Mink predation, complete with canine marks which correlated with a Mink jaw size.

Little Minnis (J551604)

Two Common Gull eggs were found on Little Minnis and both had been depredated by a mammal. The bite hole shape wasn't a typical oval shape on either of them, and as such, the bite measurements don't match that of Mink or Otter. It is possible that both of these eggs were subject to multiple bites. If this were the case, it would be more likely that these were taken by Mink. As it is, the evidence is not conclusive enough to identify the predator on Little Minnis.

Green Island (J548597)

Green Island produced two predated eggs, both belonging to an Oystercatcher. Both eggs displayed the round bite hole on the long axis that is expected of a mustelid. Based on the diameter of the bite holes, it would seem most likely that both eggs were depredated by an Otter.

Dunsy Rock (J552588)

Dunsy Rock was more intensively studied than the other sites listed in this report as it was the main site of the colony disturbance study. A single egg shell from this island had a round incision, complete with canine punctures, the spacing of which were diagnostic of Mink. Unusually the egg was not licked clean. Two further egg shells were found on the island, both of which appeared to have been depredated by a mustelid. However, there was insufficient evidence on the shells to identify the exact species.

Also on the island, a number of carcasses were found. All were Sandwich Terns, with many having wings bitten cleanly off, others where the chest had been eaten into, as well as a few severed heads. They were all located on the same survey session, suggesting that this may have been an opportunistic spree. This 'kill as much as possible' technique is more typical of Mink than Otter, as Mink are known to exhibit caching behaviour. However, there is one carcass which was bitten cleanly into two, with just the lower body and legs remaining. This in all likelihood would require a much greater jaw size than that of a Mink, which only leaves Otter as the culprit.

The few severed heads that were recovered showed damage that was consistent with a Peregrine attack. It is possible that as many as three different predators were causing mortality on the island during the breeding season in 2014.

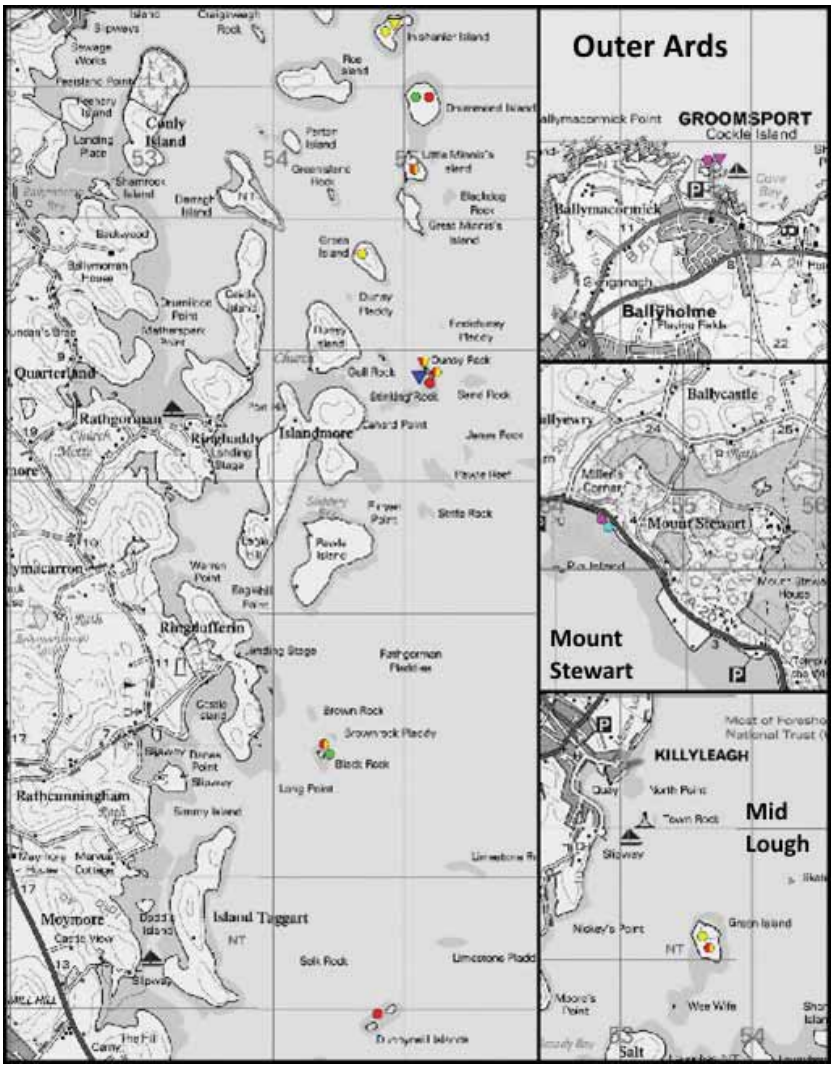

Figure 1 The distribution of detected predation signs. Circles indicate predated eggs, while triangles denote carcasses. The colours represent the predator present.

Black Rock (J544560)

Black Rock was the scene of both gull and mustelid predation. Three eggs were depredated by gulls, with an additional egg showing signs of having been damaged by a gull (Figure 2) and a mustelid. There were three eggs that all appear to have been bitten by an Otter, based on canine puncture marks in the shells. A final egg was so severely damaged, it is impossible to conclude to which species the predator belonged.

Dunnyneill (J549540)

Dunnyneill produced seven egg shells, all of which were found to have been depredated by Mink (Figure 3). It was also here that a Mink scat was observed. This island could be the focus of any future attempts to control Mink on Strangford Lough, on the basis that it was formerly one of the best seabird colonies on the Lough and because it requires a considerable swim across exposed water to get to it from the mainland which reduces the likelihood of rapid re-colonisation after successful eradication.

THOM SHANNON/HUGH THURGATE

Figure 2 Herring Gull egg predated by gull

THOM SHANNON/HUGH THURGATE

Figure 3 Mallard egg predated by Mink

KILLYLEAGH

Green Island (J537512)

Four egg shells were recovered from this island near Killyleagh. One was clearly depredated by an Otter (Figure 4), while the remaining three are less conclusive but also appear to have been bitten by Otters.

THOM SHANNON/HUGH THURGATE

Figure 4 Greylag Goose egg predated by Otter

MOUNT STEWART

Old Schoolhouse Shoreline (J545703)

Though not systematically surveyed, the shoreline outside the Old Schoolhouse produced a collection of eggs that had presumably been washed down from the woodlands through the outflow pipe which runs under the road. The eggs that were found all belonged to woodland birds. One egg appeared to have been the subject of Rat feeding, while the remainder of the collected shells had probably been depredated by Pine Marten *Martes martes*.

OUTER ARDS

Cockle Island (J536838)

Cockle Island produced 'good numbers' of fledged Black-headed Gull and Sandwich Terns but had been subject to rat predation during the nesting season. The island had a number of dead chicks and broken eggs that showed the characteristic traits of Rat predation. Long term success of any Rat eradication programme would be unlikely due to the islands proximity to the mainland. Rats would easily be able to swim out to the island and repopulation would inevitably occur. However, annual control may have a beneficial impact on egg and chick survival as there was no evidence that Rats were living on the island, rather that the predation had occurred after a foray from the mainland. The rocky substrate and very superficial shell layer would make it difficult for Rats to dig burrows but they are often present in the nearby harbour wall and have been observed swimming in the harbour (K. Leonard *pers. comm.*).

Conclusion

There were relatively few predation events witnessed on Strangford Lough during the breeding season of 2014. Gull attacks appear to be opportunistic, an attempt to limit the breeding success of neighbouring birds and reduce competition. Mustelid attacks were distributed widely throughout the Mid-Lough islands, with some islands witnessing predation events by both Mink and Otter. This suggests that the Otter population on the Lough are not limiting the range of Mink. There is a valid argument that with limited resources the island of Dunnyneill should be given serious consideration for any future Mink control as it was the site containing the greatest number of Mink predation events (based on egg shell analysis) as well as the most conclusive evidence of Mink presence (the scat and possible Mink run observed on one visit).

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Lower Lough Erne Islands RSPB Nature Reserve Breeding Seabird Report 2014

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Introduction

The islands of Lower Lough Erne, Co.Fermanagh are home to seven regularly breeding seabird species on 12 islands across the lough. Due to the continual presence of an RSPB warden since 1968 there has been regular monitoring of most species since then, both on and off the RSPB's Lower Lough Erne Islands Nature Reserve, formerly known as Castle Caldwell Forest Nature Reserve. A full overview of recent seabird monitoring and population changes was given in Robson (2014).

Numbers in parentheses are the number of AONs in 2013, for example 124 AONs (56) means 56 nests were present in 2013, 124 in 2014.

Sandwich Tern *Sterna sandvicensis*

The population on Gravel Ridge Island increased to 124 AONs (56), the highest count since 2005. However, torrential rain showers in early June caused tall vegetation surrounding the colony to collapse onto eggs and recently hatched young. The adults abandoned soon after so productivity was zero. See also Common Tern and Black-headed Gull.

Common Tern *Sterna hirundo*

The population increased to a record 24 AONs (10) on Gravel Ridge Island and all scrapes were on an area of purpose-built gravel installed in 2012. Since these terns lay later in the season to the Sandwich Terns and Black-headed Gulls they were unaffected by the torrential showers in early June with all nests still active after the other two species had abandoned. However a week later all nests were either predated and subsequently abandoned or *vice versa*. The Common Terns then relocated to Water Horse 1.8km NE where 26 AONs were counted and 10+ juveniles fledged.

Lesser Black-backed Gull *Larus fuscus*

The population continues to rise with 904 AONs (820) across seven islands though this is likely to be an underestimate as two sites could only be counted rather crudely from a boat. Breeding success was measured at two sites. At the first site 1.2 young fledged per occupied nest and 1.4 young fledged per occupied nest at the second site.

Herring Gull *Larus argentatus*

Two pairs nested in total on two separate islands (3). One nest fledged at least one juvenile whilst the outcome of the second nest was unknown.

Great Black-backed Gull *Larus marinus*

Three pairs nested (2), the highest number since 2002. Two of the pairs fledged at least one juvenile each.

Common Gull *Larus canus*

The population fell slightly to 143 AONs (146) across four sites. Productivity varied from 0.68 to 1.88 fledged young per AON.

Black-headed Gull *Chroicocephalus ridibundus*

The population increased to 1,002 AONs on Gravel Ridge Island, the highest since Seabird 2000. However as described above torrential rain showers in early June caused tall vegetation to collapse onto the young leading to almost complete breeding failure. Only 24 fledged young were recorded. Fifty-six pairs then relayed on Water Horse with several fledged young seen though an accurate count was not obtained.

Mediterranean Gull *Larus melanocephalus*

The male returned to a single site in late April and soon paired with a female Common Gull. The male Mediterranean Gull was seen protecting a nest of three eggs soon afterwards which was incubated by a Common Gull though the parentage of the eggs was unknown. The outcome of this nest was unknown. The Mediterranean Gull was not seen attending any young and no unusual juveniles were seen.

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Gulls as Carriers of Antibiotic Resistance in Northern Ireland

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Abstract

Antimicrobial resistance (AMR) is a growing threat to human medicine. Pollution of the environment with antibiotics has lead to AMR bacteria being found in a wide variety of environmental sources. One such source is waterbirds such as ducks, geese & gulls. Environmental sources may act as a reservoir of resistance genes and birds in particular are capable of travelling over large ranges for both feeding and migration. This study is examining the gull population of Northern Ireland for the presence of AMR bacteria along with GPS tracking of individuals for clues as to how and where birds attain resistant strains. It is a collaboration between Queen's University Belfast and the British Trust for Ornithology.

Introduction

The World Health Organisation has classed the rise of antimicrobial resistance (AMR) as a major threat to future human medicine and will limit the effective treatment of bacterial diseases such as tuberculosis and gonorrhoea in the future (WHO 2013). AMR has always existed, however, in recent years the number of resistant organisms and global scale has been increasing (Levy 2002). A major contributing factor to the spread of resistance is the overuse of antibiotics, both in medicine and veterinary settings, which are then released into the environment and lead to the development of resistance (Guenther *et al.* 2011).

Increased resistance in the environment results in a larger reservoir for infection. One such source is waterbirds, resistant strains have been found in many species around the globe including but not limited to: Yellow-legged Gull *Larus michahellis* (France), Canada Goose *Branta canadensis* (USA), Glaucous Gull *Larus hyperboreus* and Brent Goose *Branta bernicla* (High Arctic), (Bonnedahl *et al.* 2009, Middleton & Ambrose 2005, Sjölund *et al.* 2008). As many birds migrate and can forage over large ranges they are capable of spreading resistance genes to and from anthropogenic habitats. Gulls in particular are successful in a wide range of human environments from urban to agricultural and are often associated with waste dumps (Rock 2005).

Increased interactions with humans may lead to sharing of bacterial infections between birds and humans. In a study of Yellow-legged Gulls in the south of France it was found that humans and gulls shared the same population of *E.coli*, indicating that bacteria were passed back and forth between gulls and humans, but it remains unclear how this is achieved (Bonnedahl *et al.* 2009). Recent advances in technology, such as remote download of GPS positions through the mobile network, have made tracking of the foraging and migration of birds more viable. This technology may be vital to understanding how birds and other animals could act as vectors of resistance as it has been used for other health issues such as avian flu (Newman *et al.* 2009).

To date there has been no such research carried out on the gulls of Northern Ireland and the use of GPS for tracking locations where AMR may be acquired by individuals is a novel approach. A recent study of AMR sampled Herring Gulls *Larus argentatus* from the Republic of Ireland and found resistance in 11% of samples (Stedt *et al.* 2014). This study will take a closer look at individual birds by taking samples directly from the cloaca rather than collecting faecal samples from unknown individuals and relating it to tracking data or other features such as age class, species or location.

Other than urban habitats another potential interaction between gulls and humans is through aquaculture. This study is part of a larger Interreg IV project, the IBIS project (http://loughs-agency.org/ibis), which seeks to improve the sustainability of the aquaculture industry in Ireland, Northern Ireland and Scotland. Regular shellfish hygiene sampling is essential to ensure public safety and the economic viability of the industry. *E.coli* levels are regularly checked in both shellfish stock and water as an indicator for general bacterial levels. Shellfish production areas, such as Carlingford Lough, are important for gull populations. Mussel beds provide a rich food source and oyster farms attract large numbers of gulls which feed on easy to reach crabs living in the trestles and also flock to areas where workers have been disturbing the substrate and seaweed (*pers. obs.*).

This study intends to compliment this surveying by sampling a variety of gulls from several regions of Northern Ireland for *E.coli* and further testing the antibiotic susceptibility of the samples. GPS tracking devices deployed on a number of individuals will assess their foraging habits to see if they provided clues to where birds may acquire and transmit resistance. The project is interdisciplinary and draws together the resources of several groups: QUB Biological Sciences & Centre for Infection and Immunity who worked on sample collection and analyses, and the British Trust for Ornithology who are providing the GPS tracking capabilities.

Methods

Gull trapping

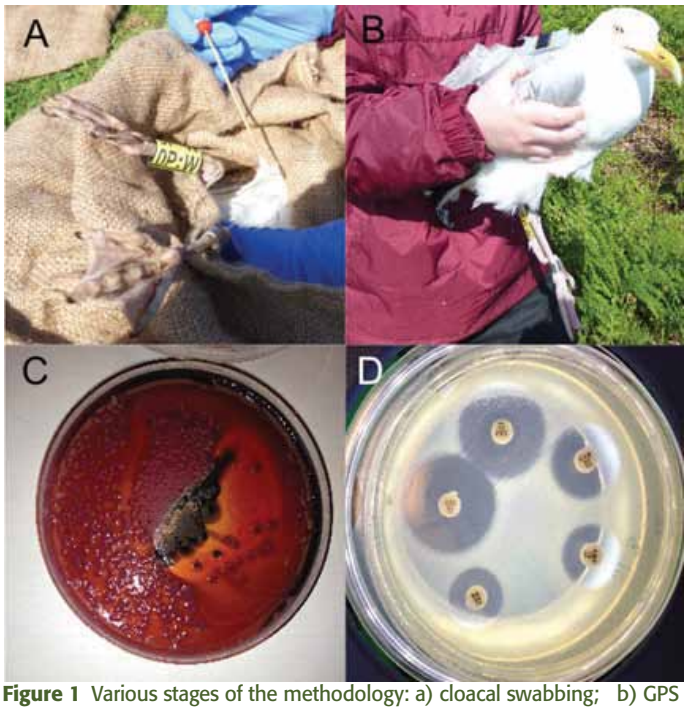
A variety of methods are used to capture different species of gull and both adults and chicks will be sampled.

- To trap roosting Great Black-backed Gulls *Larus marinus* on a small island in the large tidal flat at Millbay, Carlingford Lough, whoosh nets are set during the low tide period and, when birds come down to roost at high water, they will be within the reach of the net.
- Nest traps are used to target Herring Gull and Lesser Black-blacked Gulls *Larus fuscus* breeding on the Copeland Islands. Nests with eggs are located and a wire mesh trap is placed over it with the door facing the direction of the adult's entry tracks. When adults return to the nest to incubate the eggs they become trapped.
- Chicks are caught from around breeding sites on the Copeland Islands later in the breeding season, before fledging.

When birds are trapped they are ringed and measured by BTO licensed bird ringers. Measurements of wing length, bill length and width and total head length are taken.

A sample is taken from each bird using a cotton swab gently inserted into the cloaca (Figure 1a). Swabs were inoculated into a bacterial freezing medium and can be stored for long periods at -80°C.

In addition to swabbing, selected adult Herring Gulls are fitted with GPS tracking devices which will track their foraging habits. Thus far, eight out of the intended 30 gulls have been tagged with their movements being recorded from the late breeding season over the winter months. The remaining gulls will be tagged in 2015.



SHANE WOLSEY/AOIBHEANN MORRISON

Figure 1 Various stages of the methodology: a) cloacal swabbing; b) GPS tag attached to a Herring Gull; c) culture from a swab showing *E.coli*(pink) & Salmonella (black) colonies; d) plates with antibiotic disks showing clear areas where growth is inhibited. (Photos a&b: Shane Wolsey).

Lab Analysis

Swab samples are grown on SS agar plates to identify the presence/absence of *E.coli* (pink colonies) and Salmonella (black colonies) (Figure 1c). Up to four random colonies from each individual are then selected for further growth and testing for antibiotic resistance.

The strains to be tested were grown on Mueller-Hilton agar and antibiotic susceptibility was tested using the disk diffusion method as previously described (Pérez-Gutiérrez 2010). Antibiotics will diffuse out of the paper disks at a specific rate through the agar creating a concentration gradient. After allowing the bacteria to grow overnight an area around the disks where growth is inhibited by antibiotics can be measured (Figure 1d). The susceptibilities cut-off was established according to the guidelines established by the British Society for Antimicrobial Chemotherapy (Andrews & BSAC 2001).

Initial Results

Fifty-seven individuals from four different species have been sampled to date and microbial resistance tested (Table 1). They have provided the first incidences of antibiotic resistance in the gut flora of birds in Northern Ireland from both adults and chicks. Multidrug resistance has also been observed in a number of individuals. Of the eight GPS tracking devices deployed five have been successfully transmitting data which shows individualistic foraging behaviours, in line with other studies by the BTO (http://www.bto.org/science/migration/tracking-studies/tracking-lesser-black-backed-gulls). Individuals seem to favour particular habitat types and very specific areas which may influence their bacterial community and antibiotic resistance profile.

Future Work

It is clear that AMR is on the rise but there is an opportunity for research to provide data that can help to stem its spread. Monitoring of seabirds as sentinels and GPS tracking of their movements is just one such tool. However it will take a global effort to limit the pollution of the environment with resistance and any potential threats to human medicine. The overuse of antibiotics needs to be prevented in medicine and agriculture to reduce the source of resistance and an interdisciplinary approach must be taken to track its impact.

Preliminary results are promising for the rest of the study. Antibiotic resistance has been recorded in Northern Irish birds and consistent GPS data has been recorded from five individuals. Further genetic testing of the bacterial samples may be employed to pin point the strains and identify their relationship to known clinical strains. This study will continue as a further 22 animals will be tagged and even more sampled in the coming season. Tracking data will provide long term behaviour through both the breeding and winter seasons to show how this might change for each individual.

Acknowledgements

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Table 1 Sample information 2014

Species	Number of individuals	Age classes	Location
Great Black-backed Gull	8	Adults (*n*=6) 1st & 2nd year (*n*=2)	Carlingford Lough
Lesser Black-backed Gull	3	Adult	Copeland Islands
Herring Gull	18	Adult (*n*=6) Chick (*n*=2)	Copeland Islands
Common Gull	28	Chick	Copeland Islands

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Resource use of Herring Gulls in Northern Ireland

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Introduction

Herring Gulls *Larus argentatus* have seen large declines across the UK since the late 1960s when the first seabird census, Operation Seafarer (Cramp *et al.* 1974), was undertaken. They are now included on the red list of UK Birds of Conservation Concern (Eaton *et al.* 2009) and on red list in the Birds of Conservation Concern in Ireland 3 (Colhoun & Cummins 2013). However, there is much variation in population trends at a regional scale with the species increasing in some areas whilst declining in others (JNCC 2014). In Northern Ireland the Herring Gull population declined by 96% between Operation Seafarer and Seabird 2000 (Cramp *et al.* 1974; Mitchell *et al.* 2004); although some limited recovery has occurred over the past decade. It is not fully known what factors are responsible for these declines although mortality due to avian botulism is thought to be one of the major contributing factors in Northern Ireland as well as changes in food availability (Lloyd *et al.* 1991; Mitchell *et al.* 2004). The Herring Gull is a largely opportunistic, generalist forager with a diverse diet utilising a range of resources. Their preferred diet is from the marine coastal habitat, however, when that food supply is low Herring Gulls will utilise fishery discards and terrestrial foraging sites, particularly refuse tips (Monaghan 1977; Camphuysen 1995). Herring Gulls feeding in their preferred coastal habitats have been found to breed more successfully (Pierotti & Annett 1991). Therefore, finding gulls which are feeding on discards or terrestrial items may suggest that there is not enough of the preferred food available within close range of the breeding colony (Bukacińska *et al.* 1996).

Isotope analysis

One way to determine what resources the gulls are exploiting is to use stable isotope analysis. This technique is based on the stable isotope ratios of nitrogen, ^{14}N and ^{15}N, and carbon, ^{12}C and ^{13}C. Heavier ^{15}N isotopes accumulate through the food chain and therefore higher ratios are found in species at higher trophic levels providing an indication of which trophic level prey items comes from. Carbon isotopes indicate the location a food source is from along a gradient from terrestrial, intertidal and marine pelagic habitats. Marine environments have greater levels of the heavier ^{13}C isotope so seabirds foraging predominantly in marine habitats will have higher ratios of ^{13}C to ^{12}C than birds feeding in terrestrial habitats (Cherel *et al.* 2000). Feathers are particularly useful when carrying out stable isotope analysis as they are relatively easy and non-invasive to sample and the feathers will reflect the assimilated resource use of the bird over the time period the feather was grown, usually over a time period of days to week (Cherel *et al.* 2006). By sampling feathers from chicks information can be obtained on the adult gulls' resource use during the breeding season, specifically the resources they deliver to their young. Feather samples of Herring Gulls were collected as part of a PhD project investigating the potential of seabirds as monitors on the state of shallow coastal habitats across south-west Scotland and Northern Ireland, and the potential causes of the decline in numbers of the large gulls in the UK. The down feathers of hatchlings reflect the mothers' diet during egg formation, due to nutrients deposited into the egg incorporated into the chick's down; whilst chick body feathers, which have grown since hatching, reflect what the adults are bringing back to the chicks (Klaassen *et al.* 2004). Feather samples were analysed in the Scottish Universities Environmental Research Centre and the stable isotope ratios expressed as carbon $\delta^{13}C$ and nitrogen $\delta^{15}N$, expressed in parts per million (ppm) (Cherel *et al.* 2006).

Fieldwork in 2014

During the 2014 breeding season chick down and feathers were collected from two Herring Gull colonies in Northern Ireland; Lighthouse Island in the Copeland Island group (J597857) and Green Island in Strangford Lough (J537512). Both of these locations have experienced large declines in Herring Gull populations between operation Seafarer and Seabird 2000; with an average decline of 89% in the Copeland Islands and 88% in Strangford Lough. Twenty-six broods were sampled on Green Island (12 for hatchling down and 14 for chick feathers), whilst 47 broods were sampled on Lighthouse Island (22 for hatchling down and 25 for chick feathers). The carbon and nitrogen isotope values obtained from these samples are shown in Figure 1 indicating that the Herring Gulls at the two colonies are foraging on different resources; with the gulls on Green Island feeding at a higher trophic level ($F_{1,71}$ = 62.27, p <0.001) and on more marine resources than those on Lighthouse Island ($F_{1,71}$ = 63.81, p <0.001). There was no difference in the carbon or nitrogen ratios between hatchling down and chick feathers (p = 0.996 and p = 0.379 respectively) suggesting that within each colony the gulls are relatively consistent in the resources they are utilising during the pre-laying and chick rearing periods.

As one would expect, birds using more marine resources also foraged at a higher trophic level whereas birds foraging terrestrially foraged on a lower trophic level, resulting in a positive correlation between $\delta^{13}C$ and $\delta^{15}N$. Based just on colony locations it could be expected that the Herring Gulls breeding on the Copelands, which is located offshore, would have a higher marine component in their diet than those on Green Island located in Strangford Lough. However, from the lower carbon isotope signature of the Copeland birds it appears that these birds are instead feeding to a larger extent in terrestrial habitats picking up lower trophic prey than birds from Green Island, which are potentially feeding on marine invertebrates (Kim 2008). The indication that Green Island gulls are feeding at a higher trophic level needs to be investigated in

more detail as this may be attributed to feeding on prey items in the Lough which have a naturally higher $\delta^{15}N$ (possibly attributed to accumulating farm land run off in to the Lough). To determine more specifically what the gulls may be feeding on, pellets collected from the colonies over the same time period are to be dissected. We also have further information on resource utilisation from five additional colonies in south-west Scotland which should allow us to identify which environmental factors may be driving the differences observed in resource use between colonies and determine whether this has consequences for the gulls.

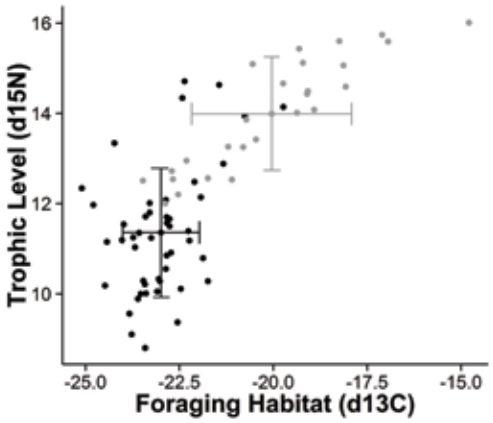

Figure 1 Mean and standard deviation of stable carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) isotope values of Herring Gull chicks from Lighthouse Island in the Copelands (black symbols) and Green Island in Strangford Lough (grey symbols). Individual points displayed from 73 Herring Gull broods ranging from 1 to 3 chicks per brood sampled.

NINA O'HANLON

Figure 2 Herring Gull on Copeland

NINA O'HANLON

Figure 3 Herring Gull feeding chicks

Acknowledgements

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Nest Boxes for Black Guillemots

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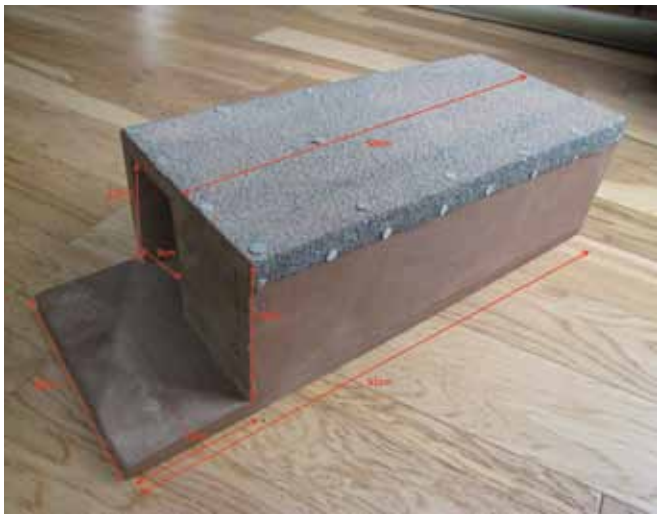
The Black Guillemot *Cepphus grylle* is a common breeding resident in Northern Ireland (Mitchell *et al.* 2004). The species breeds in crevices and burrows, though what an individual Black Guillemot may class as a crevice varies between individuals. In 2012, on Copeland Bird Observatory, a pair nested on a ledge with a short overhang in a similar fashion to a Fulmar *Fulmarus glacialis*. Another pair nested in the open at the back of a wide gully. Remarkably both pairs raised a single chick. Another pair on Copeland have long nested under an old and hardened bag of concrete which was dropped on the rocks 25 years ago. This pair usually raise at least one chick, despite being in the middle of the main Herring Gull Larus argentatus colony with a total crevice length of under 30 cm. In Bangor Harbour, Warrenpoint and other places drainage pipes are utilised. The species is noteworthy among the auks as it has adapted to use nesting sites close to human activity, principally in harbours and ports. Black Guillemots have bred in man-made holes in Bangor Harbour since at least 1912 (Workman 1914). Such has been the success of the species in these sites, for example Bangor Harbour, that there may not be sufficient suitable nesting spaces. In other locations wave resistant construction of harbour walls have left no spaces for Black Guillemot nesting holes. In natural sites such as on Copeland a lack of rock crevices or burrows will limit population growth but Black Guillemots will readily breed in purpose built sites. For example in Bangor the redesigned pier included built-in concrete nesting sites and these have been used successfully over many years (Greenwood 2010, Greenwood 2013). However construction of such sites may only be possible during the building of a new jetty, or be incorporated into a renovation.

At Copeland Bird Observatory wooden nest boxes have been utilised since the early 1980s. Occasional new boxes were added over the years, often constructed from driftwood collected on the shore. Around the turn of the millennium, thanks to a donation by Sam Goodall, a further 20 nest boxes were constructed and deployed. These boxes have been used with great success by the birds. The design of the Copeland boxes is very simple (Figure 1). It is probable any similar box would work equally as well, the birds are not fussy, but there are three key design features. First a wooden 'stop' must be placed two thirds of the way to the back of the box. This is to stop the eggs rolling out, or being displaced easily by non-parental birds. Secondly the entrance cannot be too large, approximately 9 cm by 12 cm is ideal. Finally it is best if the box has a shelf at the front, particularly if it is to be hung from a wall or under a pier. Black Guillemots like a safe landing area and will often sit at the entrance to their nest. Small pebbles or soil can be placed in the bottom of the box but this has never been found to be necessary and birds will nest on the bare wood.



KERRY LEONARD

Figure 1

In recent years several projects have been undertaken to provide nest boxes for Black Guillemots. In 2012 Newry & Mourne District Council undertook a small project to create new nesting places. Engineering works along the Warrenpoint to Rostrevor Road were necessary to prevent the road falling in to the sea during a high-tide event. As a consequence drainage pipes were filled, removing Black Guillemot nesting sites. A total of ten boxes were deployed within the grounds of Warrenpoint Port Authority (Figure 2). These boxes were slightly longer than usual (Figure 3). It was thought that the longer boxes may give birds more protection, and that the extra weight would keep them in place in the event of a very high tide. Two boxes were being utilised by birds in 2013.

KERRY LEONARD

Figure 2

KERRY LEONARD

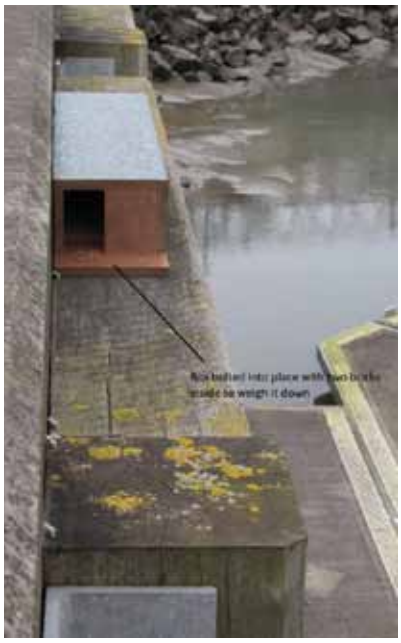


Figure 3

In 2012 boxes of this design were used in a Copeland Bird Observatory Project on both Lighthouse Island and Mew Island. The species has been expanding on to Mew in recent years, partly thanks to crevices being created by Walker Simpson and George Thomson, but a paucity of suitable nesting sites would reduce the potential for future expansion.

In 2013 15 boxes were installed at Bangor as part of an 'Action for Biodiversity' project. These boxes were installed both below the piers and on brackets attached to the pier walls (Figures 4 and 5). However they were installed too late in the spring that year to be used as nesting sites. In 2014 three of the new wooden boxes were used but no young were raised. It was likely that the birds involved were inexperienced youngsters. Other 'new' sites at Bangor over the last 30 years have frequently been unsuccessful in the first few years of use. It is planned to install further wooden boxes in Bangor Marina in readiness for the 2015 breeding season.

Overall nest boxes are a very good way to encourage breeding Black Guillemots and projects like these have been a great success, for instance in Glenarm Harbour where purpose-built holes in a pier construction has led to breeding success. There are still some spare boxes available for those who would like to install them in places where Black Guillemots breed. Thanks to Ronald Surgeoner a small number will soon be installed around Belfast Harbour and if you know of anywhere else suitable (with permissions!) then contact the authors.

JULIAN GREENWOOD

Figure 4

JULIAN GREENWOOD

Figure 5

Acknowledgements

The wood and materials for the boxes deployed in Bangor were provided through an 'Action for Biodiversity' project funded by Interreg (part of the European Regional Development Fund) through the East Border Region and managed through the North Down and Ards LBAP Steering Group. We are grateful for this funding and the assistance of Ron Murray, Andrew McLawrence and Patricia Mackey. We must also acknowledge the vital assistance provided by the staff of Bangor Marina, particularly Kevin Baird and Peter Scott (who installed the boxes).

The Copeland Bird Observatory project was funded by the Northern Ireland Environment Agency through the NGO Challenge Fund administered by Northern Ireland Environment Link. We are grateful for this funding.

The boxes at Warrenpoint were funded by DOE Road Service through Newry and Mourne District Council, thanks for the assistance of Hayley Sherwin, Danielle Begley and Kevin Scullion. Warrenpoint Harbour Authority gave permission for the boxes to be installed and carried out the installation work.

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Breeding Sites and Breeding Success in 2014 of Black Guillemots at Bangor Marina, Co. Down

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Background

A review of Black Guillemot *Cepphus grylle* breeding in the Marina at Bangor, Co. Down was provided in the Northern Ireland Seabird Report 2013 (Greenwood 2014a) which updated two previous reviews (Greenwood 1998, Greenwood 2010). The purpose of this account is to provide a summary of breeding statistics for 2014 thus providing summary data for a project that has been ongoing now for 30 years, the longest study of the species in Europe and second in length only to George Divoky's study in Alaska (see www.cooperisland.org). In addition, breeding sites within the Marina will be described.

JULIAN GREENWOOD

Figure 1 One of Bangor's Black Guillemots on the North Pier

Breeding sites within Bangor Marina

There are a number of sites within Bangor Marina where Black Guillemots (Figure 1) breed: the North, South and Central Piers, the navigational dolphins and the Long Hole (Figure 2). The traditional site is the North Pier (now called the Eisenhower Pier) where breeding was first attempted in 1911 (Workman 1914. Figure 3 shows the North Pier a little before that time). The North Pier holes are modifications of the original holes that occurred when the North Pier underwent modification in the late 1970s. Figure 4 shows one of the 15 holes in the North Pier. The 27 boxes beneath the Central Pier are made from two breeze blocks cemented to the tops of supporting pillars (Figure 5). The marina face of the Central Pier has three plastic tubes covered at one end as well as nine new wooden boxes (Figure 6, see Leonard *et al.* 2015). The South Pier has six drainage holes (now dry) that are used for breeding (Figure 7). The navigational dolphins at the entrance to the harbour have an enclosed space beneath each end of a pedestrian access bridge between the dolphins (Figure 8): the public have no access to the dolphins. Finally a further five holes in the Long Hole were previously drainage holes for the adjacent road (Figure 9). In addition there is a variety of nooks and crannies that are used for breeding from time-to-time; for instance within a service duct beneath the Central Pier.

Figure 2 The locations where breeding occurs in Bangor Marina (Photo courtesy of Bangor Marina)

Figure 3 Bangor's North Pier showing the wooden stanchions on the face of the pier which, when they began to rot, provided cavities for Black Guillemots to breed. This photograph from the Lawrence Collection (Courtesy of the National Library of Ireland) was taken a little time before Black Guillemots first began breeding in Bangor Harbour in 1911

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Figure 4 One of the 15 North Pier nesting holes. Each hole has a square profile of about 30cm x 30cm and is about 100cm in length. Some of the slightly larger holes (like the one illustrated) have a reduced entrance to lessen predation by Hooded Crows *Corvus cornix* and Herring Gulls *Larus argentatus*

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Figure 5 One of the 27 Central Pier breeding chambers. Each entrance is about 15cm square with a depth of about 60cm. Black Guillemots consistently use the lower hole as they have a platform provided by the top of the pier pillar upon which to land; they have never used the upper hole

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Figure 6 The marina face of the Central Pier showing plastic breeding tubes and wooden boxes. The plastic tubes have a diameter of about 25cm and are about 120cm long; they are open at one end only. The wooden boxes are described in detail in Leonard *et al.* 2015

JULIAN GREENWOOD

Figure 7 One of the six South Pier breeding holes; each hole has a diameter of about 15cm and a length of about 120cm

JULIAN GREENWOOD

Figure 8 The Navigational Dolphins: the gap beneath the walkway has space for Black Guillemots. These gaps are quite open and spacious although a small service duct (about 12cm diameter) at the rear of the ledge provides safety from predators

JULIAN GREENWOOD

Figure 9 One of the Long Hole breeding tubes. Each tube is about 20cm in diameter and about 100 cm in length. The masonry around some of the tubes has decayed and some birds use that space instead leaving them very exposed

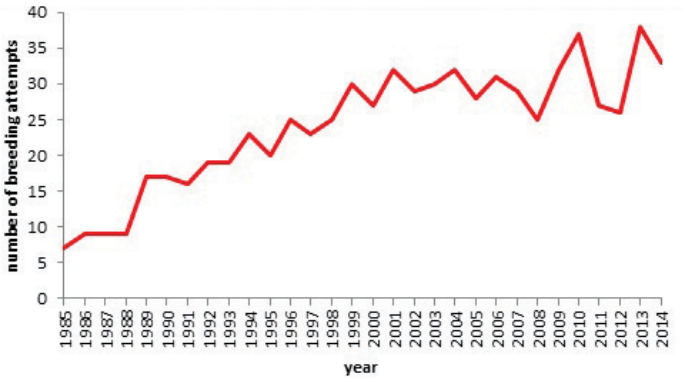

Figure 10 The steady increase in breeding attempts over the last 30 years

Figure 11 The first-egg dates for Black Guillemots breeding on the North Pier. 2014 was amongst the latest years for the onset of egg-laying over the last 30 years

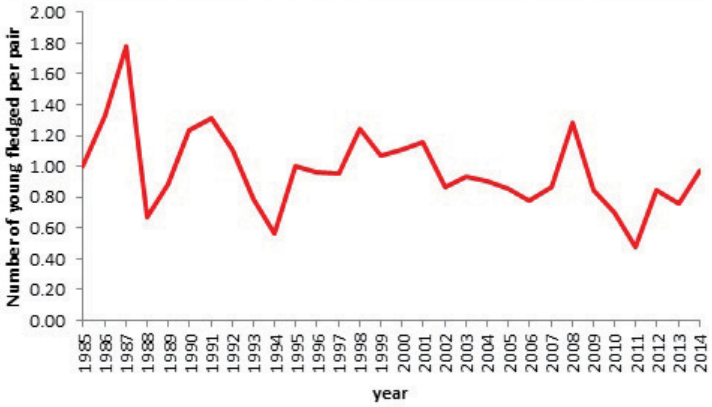

Figure 12 Breeding success (young fledged per pair) over the last 30 years

Breeding numbers in 2014

In 2014, 33 pairs of Black Guillemots bred in the Marina which was third only to last year's record high of 38 pairs and 2010s 37 pairs (Figure 10). Despite the slightly lower number of breeding attempts in 2014 compared to the previous year, the trend continues to show a rise in breeding attempts. In 2014 nine pairs attempted to breed on the North Pier; eight pairs attempted to breed beneath the Central Pier; nine pairs attempted to breed on the South Pier and the marina face of the Central Pier. It is of interest to note that three of the nine new wooden boxes on the Marina face of the Central Pier were used in 2014: they were not used in 2013 as they were positioned too close to the onset of the breeding season that year. The three breeding attempts in those wooden boxes did not succeed in 2014. There is a high degree of nest-site fidelity amongst Black Guillemots and it seems likely that the new boxes would have been occupied by younger, more inexperienced birds. Indeed, two sitting birds were captured from these boxes in 2014 and neither of them was ringed, suggesting that they may have originated from other breeding colonies – many adults that nest in Bangor have been ringed. Finally two pairs attempted to breed on the navigational dolphins at the entrance to the harbour and a further five pairs attempted to breed in the Long Hole.

First-egg date in 2014

In 2014 the average date of laying for the first-egg was 26th May (based upon North Pier data which is the only place in the Marina where reliable estimates can be made). Figure 11 shows the first-egg dates for the North Pier and it can be seen that 2014 was a late year for the onset of egg-laying. There is evidence that the onset of egg-laying is associated with seawater temperature with warmer springs bringing the date forward (Greenwood 2007). It is hoped that this can be further investigated but at the moment that is not possible as the data source for Irish Sea seawater temperatures is no longer available (so if anyone knows of data sources for Irish Sea seawater temperatures I would be extremely grateful). However, there is circumstantial evidence concerning seawater temperatures; local commercial inshore fishermen notice that when the water is cold, as in the period 2012/14, then the Lobster-fishery's onset is delayed. Black Guillemots will respond likewise and will delay breeding until their main prey, Butterfish *Pholis gunnellus*, are active and thus available for provisioning chicks when they hatch 30 days after clutch completion (Greenwood 2010). Timing breeding to coincide with maximum food availability is typical in birds (Lack 1968).

Breeding Success in 2014

The productivity for 2014 was 0.97 young raised per pair; the highest success over the last six years (Figure 12) and slightly higher than the 30-year average of 0.94. Success rate varied only slightly across the Marina with 1.00 young fledged per pair on the South and inner face of the Central Pier as well as the navigational dolphins down to 0.88 young fledged per pair under the Central Pier. Figure 12 shows that the trend for success has become less over the 30-year period. The reasons for this are unclear but are the subject of further analysis at the moment.

Conclusion

It can be seen that the colony of Black Guillemots at Bangor is in a healthy state: the trend of increasing breeding pairs continues to rise, even if the breeding success is trending slightly downwards. It is very likely that these trends are related and this is the subject of further research at the moment. There is still plenty of spare capacity for nesting within the Marina and there are plans to extend the wooden nest box provision (Leonard *et al.* 2015). However, it seems unlikely that all available nesting sites would be used in the future as numerical under-saturation is quite common in breeding birds (Wesolowski & Fuller 2012).

Afterword

It is always beneficial to one's research to see the popularisation of science. David Goode (2014) has used Bangor's Black Guillemots as a case study in a recent *New Naturalist* volume, whilst I wrote a popular article for *The Countryman* (Greenwood 2014b).

Acknowledgements

I am forever indebted to George Henderson for help in the field as well as to Kevin Baird and Peter Scott and indeed the entire Marina team at Quay Marinas Bangor.

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Storm Petrel Ringing at Sheepland, Ardglass

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KERRY LEONARD

The Storm Petrel *Hydrobates pelagicus* is a small pelagic seabird that breeds on small offshore islands throughout the UK and Ireland. Although the species is not currently known to breed in Northern Ireland the nearest breeding colony is very close, on Sanda Island at the Mull of Kintyre (Mitchell *et al.* 2004). Visitations by pre-breeding young Storm Petrels into UK and Irish waters during the summer are well documented (Insley *et al.* 2012) and these birds can readily be caught at night with the help of artificial sound lures.

I first started ringing Storm Petrels at Sheepland Point, Ardglass, Co. Down in August 1985. The late Brian Coburn told me that when he was sailing across the bar at Strangford Lough (this is where the water flows in and out of the Lough and gets churned up as it hits the Irish Sea.) he saw a lot of Storm Petrels feeding. Brian suggested that I should try somewhere nearby to see if I could catch and ring some. Soon after I went down to Sheepland armed with a Storm Petrel tape, a tape player and a 60 ft. mist net and caught and ringed one 'Stormie'. Ten days later the same bird was caught on Inishmurray in Donegal Bay by Joan Carson, and I have been ringing Storm Petrels ever since.

I knew when I caught one bird that others would be around for catching and ringing. Over the years we have caught Storm Petrels from all around the UK and Ireland. A typical bird is one I caught in 2005, which has subsequently been caught twice on Priest Island in Scotland. It is probable that bird is now breeding there. Another bird, at least six years old when captured on Priest Island, having been ringed at Sheepland, was also likely to be breeding at that site. Another interesting recent bird was trapped in 2011, re-caught two weeks later in Wales, and then caught the next year in Strathclyde. This bird was obviously still not breeding and was feeding around the Irish Sea. We have also re-caught three birds we ringed at Sheepland at Annagh Head, Co. Mayo, the year after ringing.

We have caught three birds ringed in the Algarve in Portugal. A 2008 bird re-trapped in the Faeroes during 2012 was another good recovery. One of the most unusual recoveries was a Storm Petrel ringed at Sheepland on 31st July and controlled in northern Norway (north of the Arctic circle) on 16th August the same year.

The best time to ring Stormies is the last week of July and the first two weeks of August because of the plankton bloom. In 2014 we went to ring at Sheepland on 3rd August expecting to get between 30 and 40 birds, but we caught nothing. The Ardglass harbour master informed me that the plankton bloom and associated fishing was not as good in 2014 and this was probably the reason for the lack of Storm Petrels.

Roll on summer 2015 and the return of the Storm Petrel.

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Tracking Terns – A Personal Perspective

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Introduction

Terns are amazing birds. The Arctic Tern *Sterna paradisaea* is probably the best known long-distance ocean wanderer with some individuals migrating between the Arctic and Antarctic waters with annual round-trips often in excess of 80,000 km (Egevang *et al.* 2010). If only our cars could undertake such journeys. They are also long lived with individuals reaching ages in excess of 30 years (BTO 2015). Perhaps surprisingly we know less about their local movements from breeding colonies than we do about their marathon migrations.

During the summers of 2009-2011 Allen & Mellon Environmental were contracted by the Joint Nature Conservation Committee (JNCC) to try and ascertain where the breeding terns at the Larne Lough, Copeland and Cockle Island colonies were feeding. The aim was to try and identify feeding grounds with a view to possible designation as Marine Special Protection Areas (SPAs). It had long been realised that protecting a breeding colony through designation was only part of the equation – what is the point unless you also designate the most important feeding areas? JNCC has been working with the four Statutory Nature Conservation Bodies to identify important marine areas around the UK that may be suitable for designation as marine SPAs to complement the existing terrestrial suite

The scientific paper relating to the overall UK-wide study is: Wilson L. J., Black J., Brewer, M. J., Potts, J. M., Kuepfer, A., Win I., Kober K., Bingham C., Mavor, R. and Webb, A. (2014) Quantifying usage of the marine environment by terns Sterna sp. around their breeding colony SPAS. JNCC Report No. 500. This can be downloaded for free from the JNCC website. This short article is a personal perspective on some of the most interesting local results.

What did we do?

In this ever increasingly high-tech world GPS loggers would surely provide the answers? Unfortunately at the time they posed a number of problems – size & weight, attachment methods and retrieving them without causing undue disturbance, intermittent signals would be of little use, *etc*. Commercially available models were simply too heavy or not recording at a fine enough granularity to be useful. The only reasonable conclusion was to 'track them' or in lay-man's terms, follow after the birds in a boat as they left the colony. To ensure that the tern was actually from the colony in question we would pick up a bird leaving its nest and follow it until it hopefully returned to the colony. The track could be logged using GPS and notes on behaviour and prey taken on recording sheets. This all seemed relatively straight forward… on paper.

There were many 'known unknowns' relating to this work. How fast can the birds fly and can the boat keep up with them? How far will the birds travel in search of food? What weather conditions will be suitable? All these questions were answered pretty quickly.

Fortunately we had made the decision to employ a very fast, safe and agile boat, North Irish Diver (Figure 1), so heading out of Larne Lough on our first run in 2009 we were quietly confident. The literature suggests top speeds are around 56 kph with foraging distances varying by species. Birds of the Western Palearctic (Birdguides 2006) suggested the foraging range of Arctic Tern was mainly within 3 km of colony and exceptionally up to 10 or 20 km, depending on the author. Similarly the information for Common Tern gives ranges of 3-10 km up to the wonderfully vague 'many scores of km'. Sandwich Terns were said to feed mainly within a 'few km' but 67 km had been recorded. Clearly there was a lack of scientific data.

Figure 1 North Irish Diver

Our initial confidence didn't last long. Some of the first Sandwich terns simply headed off overland across Islandmagee. Several more birds flew round and round the Lough before, finally, we got a real 'mover'. One thing we learnt very quickly was that following a tern in winds in excess of Beaufort Scale 3 was virtually impossible. Their straight line flight speed was bad enough but their agility and ability to turn on a sixpence, naturally followed by the boat at high speed, caused immense problems resulting in very sore backs, bloody wounds and a smashed GPS unit. Safely following the birds without taking undue risks was of course of paramount importance and we quickly learned that only days with the lightest of breezes were suitable and safe.

One would think that energetically the terns would choose the closest feeding grounds to the colony but this was not always the case. We regularly passed over dense shoals of sand-eels whilst the tern being followed simply ignored

them moving on to a more distant spot. Some did behave better, especially at Copeland and Groomsport where some successfully fished within a few hundred metres of the colony. But some individuals certainly did the unexpected.

What did we find?

Figure 2 shows various Sandwich Tern tracks from Cockle Island, Groomsport, Co. Down. Most birds were fishing relatively close to the colony but three individuals headed north-east and off we went to Scotland! The first bird we assumed to be a 'one-off' but over the three years four more birds took us to the same stretch of coastline and all were either incubating or feeding young! This is a one way trip of some 41 km and the birds' average speed was 58 km per hour. Why do the birds do this when there is excellent fishing close to the colony? The simple answer is probably because they can and still meet their energetic budgets. Perhaps there is a 'memory link' in some individuals to these beaches which are not far, as the tern flies, from former breeding sites in Lough Ryan? Another exceptional track of a bird feeding young is shown in Figure 3, the individual attained a peak speed of 66 km per hour and covered some 86 km in 2 hours 29 minutes and 21 seconds. This bird was successfully tracked back to the colony. Sandwich Terns proved to be the fastest species and in flat calm conditions the boat could only just keep up with them if they turned on the 'after burners'. Peak speeds recorded on the GPS logger were around 70 km per hour.

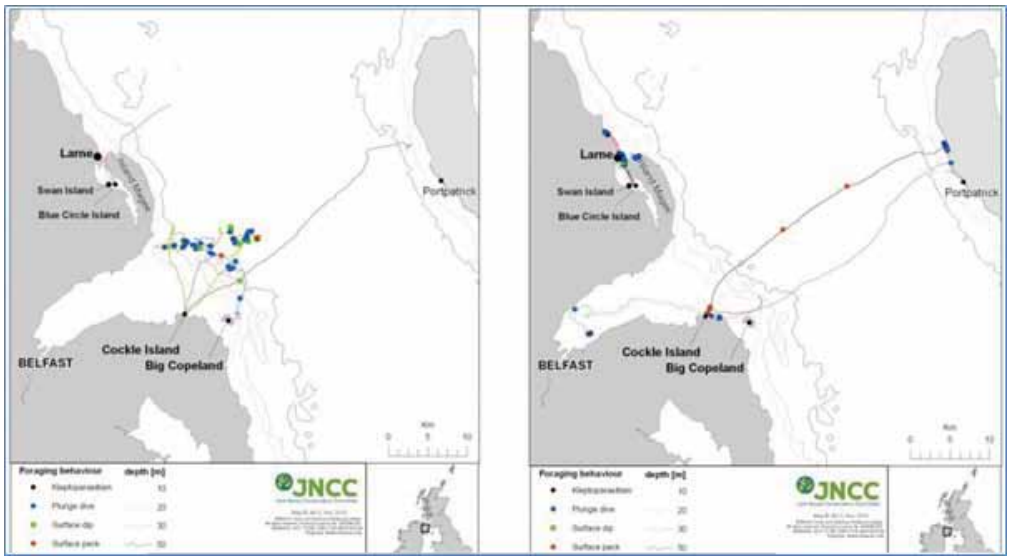

Figure 2 Sandwich Tern tracks from Groomsport, Co. Down

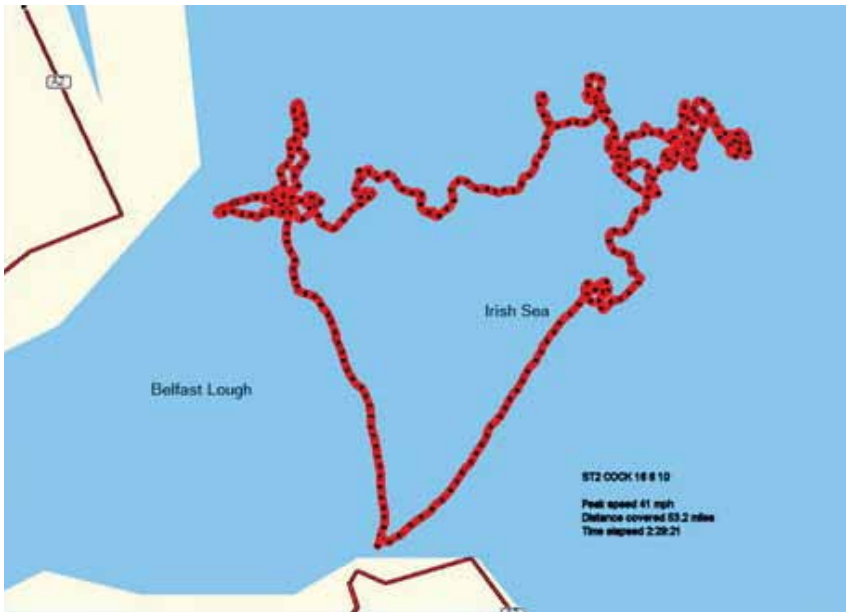

Figure 3 Sandwich Tern track from Groomsport, Co. Down

Common and Arctic Terns were always a bit slower but were still capable of the unexpected. Figure 4 shows a variety of Common Tern tracks from Larne Lough and Cockle Island. Some were successfully followed back but others were lost in flocks of feeding terns. One Common Tern which was again successfully followed throughout its feeding foray travelled 84 km in 2 hrs 23 mins 17 secs with a peak speed of 69 km per hour (Figure 5).

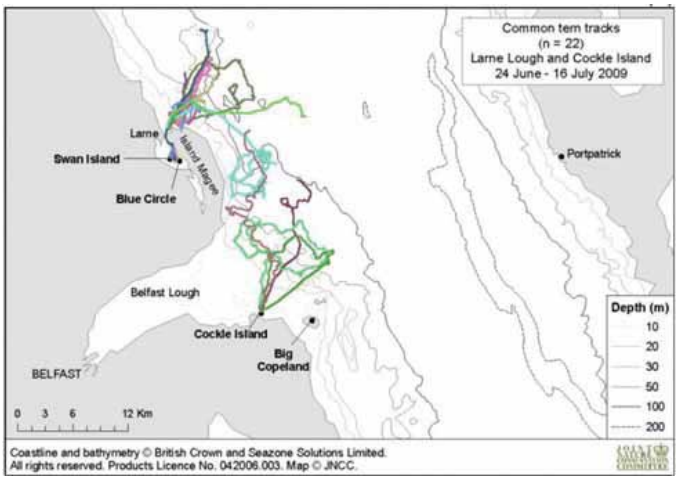

Figure 4 Tracks of Common and Arctic Terns from Groomsport, Co. Down and Larne Lough, Co. Antrim

Figure 5 Common Tern track from Larne Lough

Many of the Copeland and Cockle Island Arctic Terns fed close to the colonies using the many tidal rips and returning quickly to the chicks. On one day we recorded half a dozen such tracks and were getting complacent. The track illustrated in Figure 6 was also feeding chicks but chose a different strategy. When approaching the Scottish coast it was joined by other terns and many other seabirds, including hundreds of Manx Shearwaters, closing in on a feeding hot spot. It was inevitable that this individual was lost amongst the feeding throng but when we finally lost it after two hours the bird had covered 69 km.

I could have also related tales of the HSS in the fog, testing out transects, Minke Whales, Sooty Shearwaters, broken engines and fuel (or rather the cost of it) but there isn't space!

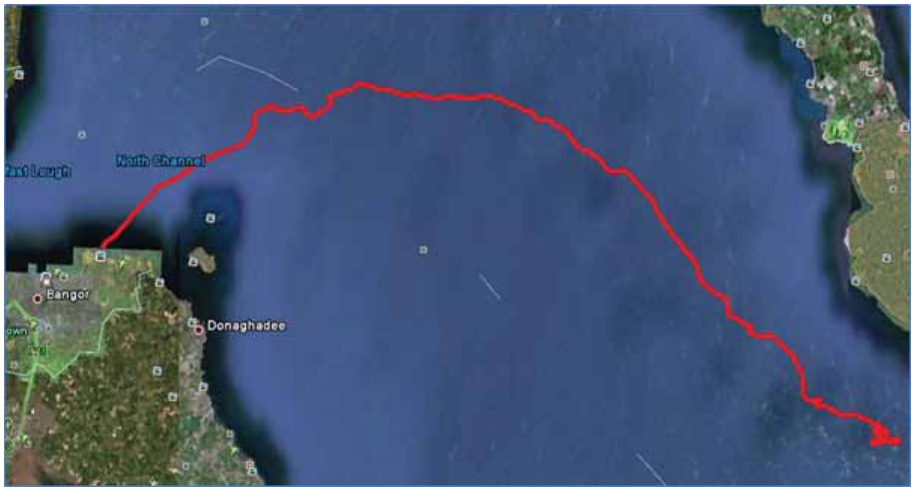

Figure 6 Arctic Tern track from Groomsport

Acknowledgements

I am grateful to JNCC for allowing me to use the track illustrations, and to Linda Wilson of JNCC for making helpful comments on this article. The work would not have been possible without the excellent North Irish Diver which gave us the necessary speed and manoeuvrability to keep up with the terns, piloted throughout by Peter Steele and Peter Christian. Dennis Weir and Kerry Leonard were on 'point' for all the runs, following individual birds sometimes for hours, whilst I scribed and logged. I will leave the conclusions to others!

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Bangor Marina
Copeland Bird Observatory
Natural Copeland
NIEA
RSPB
Ulster Wildlife

Appendix – The Seabird Co-ordinator Role

Seabird Co-ordinator

The main aim of the Seabird Co-ordinator is to facilitate an increase in annual seabird monitoring across Northern Ireland. The co-ordinator will work closely with JNCC to create a definitive register of Northern Ireland sites. The Co-ordinator will publish an annual report of the state of seabirds populations, monitoring and research in Northern Ireland. The Seabird Co-ordinator role is funded by the Northern Ireland Environment Agency (NIEA).

Steering Group

The NI Seabird Steering Group will advise on the development of a five year strategy, will advise on the evolution of a NI wide group of volunteers, the programme of activities that the Seabird Coordinator will undertake, and on the preparation of a five-year data collection strategy.

NI Seabird Network

This is a network of seabird surveyors and researchers in Northern Ireland which that will be created through the work of the Co-ordinator.

Project Aims

The aims and objectives for the Co-ordinator are as follows:

1 To act as a regional co-ordinator for the collection and dissemination of seabird data in NI.

Objectives

1.1 Ensure all data already being collected is submitted to JNCC by end year one.
1.2 Develop a five year data collection strategy within eight months of appointment.
1.3 Publish an NI seabird annual report.

Methodology

i. Identify and liaise with all current surveyors. This will include:
   a. liaising with JNCC to identify who currently provides data and who does not;
   b. liaise with known surveyors to ensure their data is available, and to understand exactly what they survey and what they do not (including RSPB, UWT, BTO, NT, consultants, and individuals);
   c. Gather all currently collected data, collate this, and ensure submission to JNCC.
ii. Identify gaps in data, including for example: geographic omissions, abundance counts, productivity, diet, birds at sea and assess practical methods for collecting these data (volunteers, professional).
iii. With the advice of the NI Seabird Steering Group prepare a five year strategy for formalising the collection of all data.
iv. Working with the NI Project Manager, the Seabird Co-ordinator will prepare an annual 'NI Seabird Report' that is suitable for public distribution at the end of each calendar year.
v. Site data for sensitive species will not be revealed.

Outputs

a. All collected data goes to JNCC Seabird Monitoring Programme, NIEA and the Centre for Environmental Data and Recording (CEDaR) in the following formats:
   i. A spreadsheet containing species-specific counts, arranged by count section and in a format compatible with the Seabird Monitoring Programme database and the NIEA computer system.
b. A five year strategy document.
c. NI Seabird Report.

2 To encourage and manage the involvement of volunteers in the collection of data.

Objectives

2.1 Create a NI Seabird Group of volunteers and act as secretary.
2.2 Develop an active surveyor network of 30 people by end year one, 40 by end year two, and 50 by end year three.

Methodology

v. Establish, by invitation, an NI Seabird Steering Group to advise on the development of the five year strategy, and to act as an advisory body for the evolution of a NI wide group of volunteers.

vi. Through open invitation, seek volunteers who would like to be members of the NI Seabird Network (with membership being free). This means that the following will be invited to join:
    a. BTO and RSPB members in NI
    b. participants in the Ocean of Wings Film Festival
    c. members of BTO NI Representative's 'bird people' list (about 500 members)
    d. other individuals who are not included in the above.

vii. Organise two seabird events that will bring together the network of volunteers annually. These events could include the following:
    a. Survey methodology training.
    b. Marine environment issues conference or workshop (possibly in partnership with UWT).
    c. A follow-up film festival.
    d. Speaker events (optimising any visit made to NI by noted seabird scientists).

viii. Regular email updates and encouragement sent to members of the NI Seabird Network.

ix. Create an NI Seabird Monitoring web presence that will facilitate the dissemination of results and will link to sources of national and international seabird information and research.

x. The NI Seabird Steering Group, and the NI Seabird Network, will forge links with The Seabird Group www.seabirdgroup.org.uk

Outputs

a. Formalised NI Seabird Steering Group.
b. Creation of NI Seabird Network.
c. Two networking, learning and awareness events annually.
d. Increased number of active volunteers assisting with surveying.
e. NI Seabird Monitoring website.

3 To champion the evolution of NI towards being a role model region within the SMP.

Objectives

3.1 Co-ordinate with JNCC within UK, and BWI in RoI, throughout period of appointment.

3.2 Promote and encourage new research into seabird distribution, productivity, survival and movements with a view to publication in the scientific literature.

3.3 Act as a focal point for the planning of site coverage within Northern Ireland, assisting with integration of professional and volunteer input as the next cycle of Common Standards Monitoring for national and European designated sites and the UK National Seabird Census approach.

Methodology

i. Maintain regular and appropriate communication with JNCC and BWI.
ii. Identify all historical seabird colonies in Northern Ireland.
iii. Create a comprehensive register of seabird breeding sites in Northern Ireland.
iv. Through advice from the NI Seabird Steering Group and close liaison with NIEA, identify, and prioritise, areas of weak survey coverage, as well as research needs and opportunities.
v. Identify seabird ecology monitoring projects which can be carried out to give improved data on seabird ecology and productivity.
vi. Identify additional sources of funding that will assist with enhanced survey costs.
vii. Encourage NI Seabird Network members to access existing JNCC grants for volunteers.
viii. Actively manage volunteers to survey all seabird breeding sites.
ix. Make appropriate assessments with regard to the ability and expertise of volunteers to undertake certain surveys.
x. Total survey effort – volunteers and professionals – will be recorded.

Outputs

a. Regional (NI) seabird trends will be available for key species.
b. Regional productivity data for key species will be available on an annual basis.
c. Robust data available for regional marine policy making and protection action planning.
d. Increased output of scientific papers.

This is the second edition of the Northern Ireland Seabird Report, covering 2014. 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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Looking out for birds