

The newsletter of the Goose & Swan Monitoring Programme

goose news

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What's hiding behind the hill?

GPS tracking of Pink-footed Geese

Latest results of GSMP surveys



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Editorial

Welcome to the 18th edition of *GooseNews*.

This edition marks the start of a season which sees the 60th Icelandic-breeding Goose Census (IGC; see page 15) and the sixth International Swan Census (see page 5) take place. Both censuses monitor their respective goose and swan populations at the flyway (*i.e.* international) scale; thus the data collected are used to estimate the size of the whole population. However, these data, along with those from other goose and swan surveys, also contribute to national estimates and earlier in 2019, the most recent estimates for wintering waterbirds in Britain were published - see page 29.

Amongst the estimates listed for wintering geese, the largest by far is that for the Greenland / Iceland Pink-footed Goose (510,000 individuals), one of the populations monitored by the IGC (see page 14). Like other similar censuses, the IGC aims to cover as many sites used by the geese as possible in order to estimate the total number of geese in the population. This means that we need to keep an eye out for any changes in the distribution of the geese, particularly the use of

new sites, so that we can try to ensure good coverage during each census. A recent study of GPS tagged Pinkfeet has shown how technology can help us locate new survey sites; with data collected during the project identifying a number of possible new Pinkfoot roost sites that we previously did not know about (see page 6).

It is widely recognised that many bird surveys would not be what they are without the considerable contribution from the networks of volunteer observers. However, there are also teams of volunteers providing essential support behind the scenes, often in roles that may seem less inspiring than being out in the field (see page 8), and to them we must also remember to give our sincere thanks.

And so to all who contribute to goose and swan monitoring in Britain, Ireland and beyond, we thank you for your continued support.

Colette Hall



Photo: Otto de Vries

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Survey dates for 2019/20

Icelandic-breeding Goose Census (IGC)

The IGC national organiser is Kane Brides (kane.brides@wwt.org.uk)

The coordinated census dates for autumn 2019 are as follows:

Pink-footed Goose: 19/20 October and 23/24 November

Iceland Greylag Goose: 23/24 November

Ideally, all sites supporting Pink-footed Geese should be covered during the October and November counts, whilst those holding Iceland Greylag Geese should be covered in November.

We would like to encourage all counters at sites within the range of Iceland Greylag Geese to also carry out a count during September if the site also supports British/Irish Greylag Geese. September counts are not strictly coordinated but ideally should be carried out during the middle of that month, although any counts made during September will be of value.

If you are unable to count on the above dates, please contact either your Local Organiser or Kane Brides, so that we may try to arrange cover of your site by another counter.

Help needed to cover IGC sites

Recent data from tracking GPS tagged Pinkfeet have revealed a number of possible new roost sites for these geese (see the article on page 6). Therefore, we are looking for counters who would be willing to visit sites in Lanarkshire for the IGC in 2019 to investigate further. We are also looking for counters in Lancashire and Angus to cover current IGC sites where a counter has retired.

If you are a counter in one of these regions and you are interested in helping, please contact your Local Organiser in the first instance. For any new counters or for counters without a Local Organiser, please contact Kane Brides (kane.brides@wwt.org.uk).

Find out more

Visit WWT's Waterbird Monitoring website at <https://monitoring.wwt.org.uk/our-work/goose-swan-monitoring-programme/> to find out more about the Goose & Swan Monitoring Programme (GSMP), including detailed survey results and all editions of *GooseNews*.

Details about all the GSMP surveys, including how to get involved, can be found on the website at <https://monitoring.wwt.org.uk/get-involved/>.

Greenland White-fronted Goose Census

The census is organised by the Greenland White-fronted Goose Study (<https://greenlandwhitefront.org>).

Please contact the organiser Tony Fox (tfo@bios.au.dk) for further details about the census.

Count dates for the 2019/20 census are as follows:

Autumn and spring coordinated censuses:
14–18 December 2019 and 14–18 March 2020

We very much welcome counts from all other dates and times, but for the monthly counts we especially appreciate counts in the following periods:
23–27 November 2019, 18–22 January and 22–26 February 2020

Enter your counts online

Counters taking part in the Icelandic-breeding Goose Census (IGC), the International Swan Census (ISC) or undertaking age assessments can enter data online using WWT's Waterbird Monitoring Online website.

You will need to register to use the system at <https://monitoring.wwt.org.uk/recording/>, where help pages are available to guide you through the process of registering and entering counts.

If you need any further information on how to use the website, please contact WWT's Monitoring Unit at monitoring@wwt.org.uk.

Reporting sightings of colour-marked birds

To report a sighting of a colour-marked bird, please first refer to the European Colour-ring Birding website (<http://www.cr-birding.org/>) where a list of project coordinators can be found, including for all WWT projects. Observations of marked birds can be submitted directly to the relevant project coordinator or in some cases by submitting sightings into online databases. If you are unable to find a project that matches the bird you observed, please submit your details to the EURING Web Recovery Form at www.ring.ac.

If you would like to report a sighting of a colour-marked bird that has been ringed as part of a WWT project, please email your sighting to colourmarkedwildfowl@wwt.org.uk.

Further information about submitting a sighting of a colour-marked bird can be found on the WWT monitoring website at <https://monitoring.wwt.org.uk/our-work/uk-waterbirds/goose-swan-monitoring-programme/colour-marking>.

International Swan Census 2020

January 2020 sees the next International Swan Census (ISC) take place across Europe. The census, coordinated by the IUCN SSC Swan Specialist Group, is carried out every five years and aims to estimate the size and distribution of the three migratory swan populations in Northwest Europe: the Icelandic Whooper, the Northwest Mainland Europe Whooper and the Northwest European Bewick's. The ISC in Britain, Ireland and Iceland is coordinated by WWT in collaboration with I-WeBS, the Irish Whooper Swan Study Group (IWSSG) and our Icelandic colleagues, and with generous help from the WeBS network.

Although WeBS and I-WeBS cover a large proportion of sites frequented by Whoopers and Bewick's, in order to attain complete coverage and a population estimate, we also need to survey areas that are not regularly covered or not covered at all by these schemes, such as feeding sites in agricultural areas. For some key sites, there may also be a need to undertake counts of roosting birds at dawn or dusk (rather than the daytime counts) in order to obtain better estimates. The ISC also involves collecting additional information on breeding success and habitat use of the swans. Therefore, the census requires additional help and support from the volunteer bird recording networks in Britain and Ireland.

Since the first census of the Icelandic Whooper Swan population took place in 1986, the population has been continually growing. The most recent census in 2015 reported a flyway total of 34,004 birds, which represents more than a two-fold increase since 1986 when 16,731 birds were recorded.

In contrast, the Bewick's Swan population has declined, with the overall census total falling from a peak of 29,277 in 1995 to 20,148 in 2015 (Beekman *et al.* In prep.). At the national level, although numbers in Britain and Ireland fell following the peak of 10,758 in 1990, the subsequent censuses saw the population remain stable

at around 7,000 birds up until 2015 when there was a significant decline to just 4,392. Ireland has seen a particularly large drop in numbers, with the census in 2015 recording just 21 birds compared with a peak of 2,004 in 1990.

The 2020 census will result in updated flyway-scale population estimates for these two populations, as well as for the NW European Whooper (found predominately on mainland Europe) which, like its Icelandic counterpart, has been increasing. Results from the census will also help researchers determine any conservation needs for these populations across their flyways; particularly for Bewick's Swan, which in 2015 was classified as Endangered in the European Red List of Birds¹ due to the decline in the population, and for which there is an AEWA International Single Species Action Plan² in place.

The census in Britain and Ireland is due to take place on the weekend of 11/12 January 2020, corresponding to the International Waterbird Census.

If you would like to get involved in the census, please contact:

Britain: Kane Brides (WWT)
kane.brides@wwt.org.uk

Republic of Ireland: Brian Burke (I-WeBS)
bburke@birdwatchireland.ie

Northern Ireland: Graham McElwaine (IWSSG)
grahammcelwaine@btinternet.com

Further information about the census is also available on WWT's Waterbird Monitoring website at <https://monitoring.wwt.org.uk/get-involved/isc-2020/>.

1 See <http://www.birdlife.org/europe-and-central-asia/european-red-list-birds-0>

2 See https://www.unep-aewa.org/sites/default/files/publication/ts44_ssap_bewicks_swan.pdf

Age assessments

Age assessments will continue during 2019/20 as usual. The survey periods vary between species and are shown below. If you are interested in helping with these surveys, please contact WWT's Monitoring Unit at monitoring@wwt.org.uk.

Population	Period	Notes
Whooper Swan	Oct – Jan	focus on mid-Jan
Bewick's Swan	Nov – Feb	focus on mid-Jan
Iceland Greylag Goose	Oct – mid Nov	care needed with age identification
British Greylag Goose	Aug – Sep	
Pink-footed Goose	mid Sep – mid Nov	
Bean Goose	Oct – Nov	
European White-fronted Goose	Oct – Jan	focus on Jan
Greenland White-fronted Goose	Oct – Jan	focus on Dec
Dark-bellied Brent Goose	Sep – Mar	focus on Oct – Nov
Light-bellied Brent Goose (both populations)	Sep – Mar	focus on Oct – Nov
Barnacle Goose (both populations)	Oct – Dec	

Coordinated Whooper and Bewick's Swan age assessments

Three coordinated census dates are set each winter for age assessments of Whoopers and Bewick's: although assessments made at any time during the autumn/winter are welcome.

The coordinated dates for winter 2019/20 are as follows:

19 November 2019

17 December 2019

11/12 January 2020

(to coincide with the International Swan Census)



What's hiding behind the hill?

Carl Mitchell & Ian Patterson

**GPS telemetry reveals where
Pink-footed Geese are roosting
at the time of the IGC counts.**

Photo: Graham Catley

The population of Greenland/ Iceland Pink-footed Geese has increased from approximately 50,000 birds in 1960 to over half a million in 2016 and 2017. However, the overall winter distribution of Pinkfeet in Britain appears to have remained largely similar to that reported in the 1960s (see Mitchell & Hearn 2004). Although the number of geese roosting at some of the sites has greatly increased (e.g. Montrose Basin, Angus) in line with the growth of the population, others have increased but subsequently decreased (e.g. Loch of Strathbeg, Aberdeenshire, and Dupplin Lochs, Perthshire). In some traditional areas, new roosts have become occupied and are now regularly counted for the Icelandic-breeding Goose Census (IGC) (e.g. Middlemuir, Aberdeenshire).

WWT have been using Global Positioning System (GPS) tags on Pink-footed Geese since December 2016 (see *GooseNews* 17:28–29). These have provided great insight into the year-round movements of the geese within the UK, Iceland and Greenland (see also <https://sites.google.com/view/telemetry/home>).

As an aside, the GPS data have also allowed the distribution of the tagged geese to be mapped at the time of the IGC counts. A preliminary examination of the location of 54 of the GPS-tagged Pink-footed Geese yielded 124 records on the weekends of the October 2017/18 and 2018/19 IGC coordinated count dates between 10pm and 4am, at a time when the geese were assumed to be roosting. The examination included only one location from each evening, but locations from successive nights were included, since the geese could have moved between sites within a weekend.

The geese were recorded at 72% of the sites that are regularly counted as part of the IGC (33 out of 46 sites). The examination also revealed several gravel pit workings, flooded fields and small lochs that the tagged geese used which, as far as we are aware, have never been counted for the IGC. It is unlikely that these hold substantial numbers of geese (but see below) and some may only be used infrequently – especially so with seasonally flooded wetlands. However, several larger waterbodies were also used, including Loch Skiach (Perthshire), Letham Moss (Upper Forth) and several waterbodies near Coldingham (Borders) including Loch Rickie, and these have the potential to hold larger numbers of geese.

Unfortunately, although we know *where* the tagged geese were roosting, we don't know *how many* birds were roosting at these uncounted sites, thus we can't be sure how many Pink-footed Geese are potentially being missed by the IGC. One way to roughly estimate how many Pinkfeet were roosting on uncounted sites might be to assume that from a population estimate of 515,800 birds counted in October 2017, each of the 38 tagged geese alive during that autumn, represented, on average, approximately 13,573 unmarked birds (this, of course, assumes that the tagged geese are distributed randomly through the population). Of the tagged geese, seven were roosting on sites that were not counted, which, therefore, represents an estimated

additional 95,011 birds on uncounted sites (or 15.5% of the revised population estimate including the missing birds). The comparable figures for October 2018 were a population estimate of 441,000 counted birds, with the 42 tagged geese alive during that autumn representing, on average, approximately 10,500 unmarked birds. Of the tagged geese, eight were roosting on sites that were not counted, which represents an estimated 84,000 *additional* birds on uncounted sites (or 16% of the revised population estimate including the missing birds). Is the IGC missing approximately a sixth of the population each autumn? As the population has increased in the last thirty years, although the broad geographic range of the wintering birds has remained rather similar, and some sites have seen comparable increases in site use, other new roosts have become occupied within those areas, and the IGC coordinators, Local Organisers and individual counters should be vigilant to new sites becoming occupied by roosting geese and try to ensure count coverage where practicable.

The use of wetlands for roosting was examined in more detail in Aberdeenshire throughout winters 2017/18 and 2018/19. In addition to the five main roosts in the county, several other roosting sites were identified: 22 in 2017/18 and 15 in 2018/19. The sites ranged from small permanent waterbodies to flooded fields, but again, the number of birds roosting there was not known. Six of these sites in the first winter and five in the second were used for at least ten goose nights. Of the 22 sites used in 2017/18, nine were used again in the following winter.

The tagged geese stayed at the newly identified Aberdeenshire roosts, on average, for seven nights in 2017/18 and for six nights in 2018/19 (a 'stay' being the period during which a tagged goose was recorded at a given roost before moving to another roost or away from Aberdeenshire). One of these sites, a set of small pools near Peterhead, was used much more than average by two of the tagged geese in 2017/18, for a combined total of 13 stays and 228 goose nights (18 nights per stay). One of the two geese was not recorded in the UK in 2018/19, but the other stayed at the pools again five times, for a total of 111 nights (22 nights per stay).

In response to this valuable new knowledge, this winter we will be seeking volunteer counters to cover as many of these potential new IGC sites as possible (see page 4). This early examination could be extended to a more formal analysis and also include other species (such as Bewick's Swan, where tracking may help identify additional roost sites at the Ouse Washes). But it also sheds an important light on the potential limits of the existing surveillance and the ability of current technology to guide us to survey new sites.

References

- Mitchell, C. & R.D. Hearn. 2004. *Pink-footed Goose Anser brachyrhynchus (Greenland/Iceland population) in Britain 1960/61–1999/2000*. Waterbird Review Series. ISBN 0-900806-43-5. WWT/JNCC, Slimbridge. 90pp.

Volunteering backstage for the GSMP

Maurice Durham

My association with the team at WWT Slimbridge goes back to 1990, when a Constant Effort Ringing Site (CES) was established in the decoy wood at the centre, as part of the national scheme organised by the British Trust for Ornithology. The scheme provides valuable trend information on the abundance of adults and juveniles, productivity and also adult survival rates for 24 species of common songbird. Over the subsequent years, I got to know Baz Hughes, Richard Hearn and Carl Mitchell well, which gave me some idea of what went on in WWT's Research Department (as it was known back then), and more especially the Monitoring Unit and its forbears. By 2007, I'd switched to working part-time (in the day job), and so offered to start computerising historic ringing data, as it would be the only way to preserve it and make it available for any future studies. I hadn't realised quite how much there was at the outset!

More recently, dealing with the historic data has taken less of my time, and I've become more involved with the wider work of the Unit. This has ranged from helping to cannon-net Bewick's Swans, to cataloguing and archiving reports and data associated with the Goose & Swan Monitoring Programme, and updating the Monitoring Unit's website.

I qualified for my A Ringing Permit in 1986, and although I don't have a cannon-netting endorsement, I've been involved with quite a few catches (mainly gulls on landfill sites). I've therefore always been happy to join WWT's cannon-netting sessions, where I can use my experience to help set the nets and process the birds afterwards. On our less successful trips, the evening discussions would occasionally turn to how to improve



Volunteers are the life force behind most bird monitoring schemes. Without their steadfast support, our knowledge of bird status would be significantly poorer and many schemes would struggle to continue. Though the majority of volunteers tend to be out in the field, a small number can be found behind the scenes providing crucial support on scheme coordination.

Maurice has been helping at WWT Slimbridge for nearly 15 years and here he tells us a little about what he's been up to during his time as a volunteer.

Photo: Sam Stafford / WWT

the cannon-netting kit and make things easier. So being of a fairly practical inclination, I've now made a two-man hide (Rich used to get very lonely in his previous one) and some keeping cages (to hold birds during catches), as well as improving the kit storage here at Slimbridge.

Over the years, the various surveys undertaken by WWT had produced a large archive of data and reports, which had been stored in various offices and an external Portastore at Slimbridge. In 2016, it was decided that in order to free up office space and remove the Portastore, all the archive material was to be sent to an offsite storage facility. This involved some 70 boxes of material for the Monitoring Unit, some of which dated back to the 1940s, and took quite a while to archive. However, it did have the major benefit that all the material is now catalogued so it can be identified and traced, for the first time in many years for a great deal of it.

And for me, some of the most exciting finds were Sir Peter Scott's original goose and duck ringing field notebooks, complete with his sketches on the covers.

In going through the archive material, master copies of various reports were found, including some early Icelandic-breeding Goose Census (IGC) reports. So we took the opportunity to review what was available on the Monitoring Unit's website to see if any were missing and also to identify any reports where the quality could be improved. Having recently finished

updating the main IGC reports, one of my next tasks is to add regional reports (which some Local Organisers used to provide) to the website. In addition, I've also uploaded reports of the supplementary counts of Dark-bellied Brent Geese that were carried out between 1985 and 1994, so these too are now available on the website.

Most of this might seem a bit dry and not involve the excitement of being out in the field actively monitoring what is going on, or even analysing the results of surveys to determine population trends and breeding success. However, it's really important to me that the effort which went into surveys in the past should be readily available to people today. I just don't have enough time to do it as quickly as I'd like!

Many thanks for all your help

The greatest strength of the GSMP and many other goose and swan monitoring projects lies in the tremendous volunteer input from you, the counters, ring-readers and other participants.

A big thank you to you all!

We hope that you will continue to support the various schemes and through these, the conservation of swans, geese and wetlands throughout the UK and beyond.

Site focus: WWT Martin Mere

Maria Scullion & Louise Clewley

WWT Martin Mere is one of a number of sites in Lancashire that are monitored annually for the Icelandic-breeding Goose Census, and where age assessments of Pink-footed Geese and Whooper Swans are regularly undertaken. Here, Maria (Reserve Placement Student) and Louise (Reserve Manager) provide a brief overview of the reserve.

Martin Mere is an internationally important wetland in Lancashire that has been managed by WWT as a visitor centre and nature reserve since 1974. It is situated in what used to be the largest freshwater lake in England which was formed after the last ice age. This would have been a perfect habitat for migratory swans and geese, with most of the area being covered in water and reedbed. However, the lake was drained in the 1800's by a local land owner with the use of steam-powered pumps to create land for crops on the fertile soil. The geese and swans have since adapted to using this to their advantage and now spend hours in the fields feeding on crops such as potatoes and carrots.

The site itself now comprises 700 acres of mixed wetland habitat, including lowland wet grassland (managed by our herd of English Longhorn cattle), marsh, reedbed and open water. We manage the reserve for our overwintering wildfowl by topping the fields in late summer/early autumn so new growth is coming through as the birds start to arrive, thus providing a good source of food. We can also alter the water levels across the site, so before the swans and geese arrive we increase the level on the Mere by about 1m to ensure that the birds have plenty of space to roost and feed.

Martin Mere is a designated Site of Special Scientific Interest (SSSI), Special Protection Area (SPA) and

Ramsar site. All three of these designations refer to the national and international importance of the site for wintering wildfowl, particularly the latter for Pink-footed Goose and Pintail. At one time, the reserve was also significant for Bewick's Swans. During the 1980s, numbers using the site increased, reaching a peak of over 1,000 in 1990/91. But the increase was short lasting, and what followed was a gradual decline during the 1990s and 2000s, with few, if any, now recorded: in 2018/19 we had one pair visit the site for a matter of minutes. A shift in the Bewick's Swans' winter distribution in recent years, associated at least partially with climate change, has reduced numbers visiting sites in northwest Britain, and most birds that do venture this far north rarely bring cygnets with them. So, unless there's colder weather in continental Europe in the coming winters, it is unlikely that many Bewick's will use the site in the foreseeable future.

Martin Mere still supports internationally important numbers of wintering Icelandic Whooper Swans, and although peak counts vary year to year, as many as c. 2,500 may roost on site. The journey for these swans from their breeding grounds in Iceland is approximately 500 miles overseas to northwest Scotland, which they tend to do in one leg. They may then take a break for a few hours before continuing to Martin Mere. Some



Whoopers use Martin Mere as a stop off during their migration, sometimes staying for a couple of weeks before moving south to the Ouse Washes in Norfolk. However, the majority of swans that do stop at Martin Mere will stay here for the whole winter.

Over the years, researchers here have grown attached to specific birds because of their incredible stories. One bird, known to us by the name Virginia, has been returning since 1993, and possibly before. She was first ringed at Martin Mere in 1993 as an adult bird so is at least 27 years old! Over the years she has had three different mates: she separated from the first, which is a little unusual for Whoopers as they tend to mate for life; her second disappeared and is thought to have died; and she has now been with her third mate for at least eight years. She has occasionally visited our Welney reserve on the Ouse Washes and, in fact, this last winter she completely bypassed Martin Mere and was sighted in Worcestershire instead!

The migration of Pink-footed Geese is an incredible feat. They migrate yearly from their breeding grounds (either in Iceland or Greenland) and winter almost exclusively in Britain. From Iceland to Martin Mere is about 950 miles and from Greenland it is about 1,500 miles. When you think about the fact that juveniles will also make that migration with their parents at only four or five months old, it really is amazing. Most Pinkfeet use Martin Mere as a stop off point on their migration further south to Norfolk; hence the peak count here occurs early in the winter. The highest count recorded to date was in October 2014 when 45,000 roosted on site. Typically, we have around 4,000 that roost on site each night throughout the winter, once the larger flocks have passed through, although numbers do vary year to year.

The Pink-footed Geese tend to start arriving at Martin Mere in mid-September. In 2018, they made their first appearance on 14 September but it wasn't until October that their numbers increased, with a peak roost count of 14,430 birds on 15 October. The first Whooper Swans of the season arrived on 23 September with numbers increasing more rapidly in October, levelling out at around 600 birds roosting on the reserve, although the number seemed to increase during cold snaps and be lower when the weather wasn't as bad. We think this is, in part, due to food being more readily available on the reserve during cold conditions, as we regularly supply

grain throughout the winter and the waterbodies remain unfrozen due to a constant movement of freshwater, which also provides open water for roosting. The birds may also prefer to move shorter distances to feeding sites when it is cold to save energy, which also makes the reserve much more of a convenient location.

Once the birds begin to arrive, counts are held once a week to ascertain numbers and preferred roosting positions across the site. The counts are done at dawn so observers must be in place before dawn with a scope and clicker at the ready. Throughout the season, The Mere (the main lake on site) was clearly the favoured position for both the Whooper Swans and Pink-footed Geese (the lake has deep water with easily accessible sides and islands to roost on), so one observer covered this area during the count. However, we also monitor other parts of the reserve namely, Vinson's and Sunley's marshes (which takes one observer), and Woodend Marsh and the Reedbed (each of which takes one person to cover), meaning four observers are required to cover the whole site. Our observers are currently three placement students and one member of reserve staff.

The Whooper Swans tend to leave at first light so counting them first is advisable. Luckily, as they are white, they stand out from the murky background, making it easier to count them than counting the geese. After this, it is easier to wait for the light to lift slightly in order to be able to distinguish the Pink-footed Geese from any other roosting geese, such as Greylag, Canada and the occasional Greater White-fronted Goose. During 2018/19, we had comparatively lower numbers to those recorded in previous winters with just under 15,000 Pink-footed Geese and 1,200 Whooper Swans being our peak counts. For the Pinkfeet, this may have been a consequence of the mild winter, with many birds choosing to stay in Scotland rather than continue on to Lancashire. Similarly, the Whooper Swans may have chosen to winter at the Ouse Washes in preference to Martin Mere: incidentally, record numbers of Whoopers were recorded at the Ouse Washes in January 2019.

If you would like to contribute an article about the site you cover for a GSMP survey, please contact Colette Hall (colette.hall@wwt.org.uk).



Photo: WWT

Latest news from GSMP surveys

The table below shows the total counts and the breeding success* of goose and swan populations wintering in Britain and Ireland, recorded during various surveys in 2018/19, except the results for Greenland White-fronted Goose which are for 2017/18. Surveys were undertaken at an international or national scale, or at a few key sites. See the individual population reports that follow for further details.

* Age assessments comprise two measures of annual breeding (reproductive) success (or productivity): the proportion of young (first-winter) birds in non-breeding flocks, and the mean brood size (number of young produced by successful breeding pairs).

More detailed results are available on the GSMP web pages at <https://monitoring.wwt.org.uk/our-work/goose-swan-monitoring-programme/species-accounts/>



Photo: Mark Wilson

Population	Total count ¹	Percentage young	Mean brood size (young per successful pair)
Northwest European Bewick's Swan	-	11.5%	1.7
Iceland Whooper Swan	-	16.1%	1.9
Taiga Bean Goose	262 ²	5.0% (Slamannan)	1.3 (Slamannan)
Greenland/Iceland Pink-footed Goose	440,891 ³	17.9%	2.0
European White-fronted Goose	-	23.1%	2.46
Greenland White-fronted Goose ⁴	20,529 ⁵	9.29% (Islay) 5.29% (Wexford)	2.97 (Islay) 2.90 (Wexford)
Iceland Greylag Goose	58,246 ³	22.6%	2.08
British Greylag Goose	-	40.8% (Tiree)	2.81 (Tiree)
Greenland Barnacle Goose	-	4.0% (Islay) 1.4% (Tiree)	1.01 (Islay) 1.08 (Tiree)
Svalbard Barnacle Goose	40,400 ⁶	6.3%	1.74
Dark-bellied Brent Goose	-	8.0%	1.88
East Atlantic Light-bellied Brent Goose	-	5.9% (Lindisfarne)	-

1 For the official UK population estimates (e.g. for calculation of national 1% thresholds) please refer to; Frost, T., G. Austin, R.D. Hearn, S. McAvoy, A. Robinson, D.A. Stroud, I. Woodward & S. Wotton. 2019. Population estimates of wintering waterbirds in Great Britain. *British Birds* 112: 130–145. The official flyway population estimates (e.g. for calculation of international 1% thresholds) are those published by Wetlands International at <http://wpe.wetlands.org>.

2 Combined total for the Slamannan Plateau (data provided by the Bean Goose Action Group) and the Yare Valley (data provided by RSPB).

3 Flyway total. From; Brides, K., C. Mitchell & S.N.V. Auhage. 2019. *Status and distribution of Icelandic-breeding geese: results of the 2018 international census*. Wildfowl & Wetlands Trust Report, Slimbridge. 18pp.

4 Results presented for the Greenland White-fronted Goose are from surveys undertaken in 2017/18.

5 Flyway total. From; Fox, A.D., I.S. Francis, D. Norriss & A.J. Walsh. 2018. *Report of the 2017/18 international census of Greenland White-fronted Geese*. Greenland White-fronted Goose Study report. 16pp.

6 Flyway total. Griffin, L. 2019. *Svalbard Barnacle Goose distribution around the Solway Firth 2018–2019: Flock counts from the Solway Goose Management Scheme area*. Final report to SNH. WWT, Slimbridge. 40pp.



Bewick's and Whooper Swan breeding success, 2018/19

Photo: Otto de Vries

Julia Newth & Kane Brides

The majority of Bewick's and Whooper Swan flocks arriving in Britain and Ireland during late autumn and early winter tend to comprise mainly of non- or failed breeders. Therefore, to make an assessment of the overall breeding success for swans wintering in these countries, it is preferable to use age counts from later in the season, as by mid-winter the majority of families will likely have arrived. Hence, for the 2018/19 season, coordinated age assessments for both species were carried out in January 2019.

Good coverage of Whooper Swan flocks throughout Britain and Ireland was achieved, with a total of 17,218 swans aged: 8,494 in England, 434 in Scotland, 2,304 in Northern Ireland and 5,986 in the Republic of Ireland. Overall, 16.1% of the birds aged were cygnets, and although lower than the previous season (18.1% in 2017/18) the percentage young was marginally higher than the previous ten-year mean (15.9% for 2008/09–2017/18), suggesting that flocks wintering in Britain and Ireland had an average breeding season in 2018.

Similarly, results for the Bewick's Swan suggest that 2018 was an average breeding season for the birds wintering in Britain. Age assessments were made

across a good sample of flocks in England (few, if any Bewick's occur elsewhere in Britain), with a total of 1,618 birds aged: 1,490 in Cambridgeshire/Norfolk/Kent, 11 in Lancashire (Ribble Estuary) and 117 in Gloucestershire/Somerset. Overall, 11.5% of the swans aged were cygnets, which is a vast improvement on 5.7% recorded in 2017/18, and similar to the previous ten-year mean (11.4% young, 2008/09–2017/18). These findings mirror those recorded by a coordinated international assessment that was carried out in ten countries across northern Europe (including Britain) in December 2018. Preliminary results indicate that amongst the 9,262 Bewick's Swans aged, 8.7% were young birds, which is a notable increase compared with the results from the 2017 assessment when only 3.9% young was recorded.

Our continued thanks goes to all who help with these age assessments, particularly to Graham McElwaine and the Irish Whooper Swan Study Group who coordinated the Whooper Swan counts in Ireland. Our thanks also to Wim Tijssen and Kees Koffijberg for the provision of the international Bewick's Swan data.

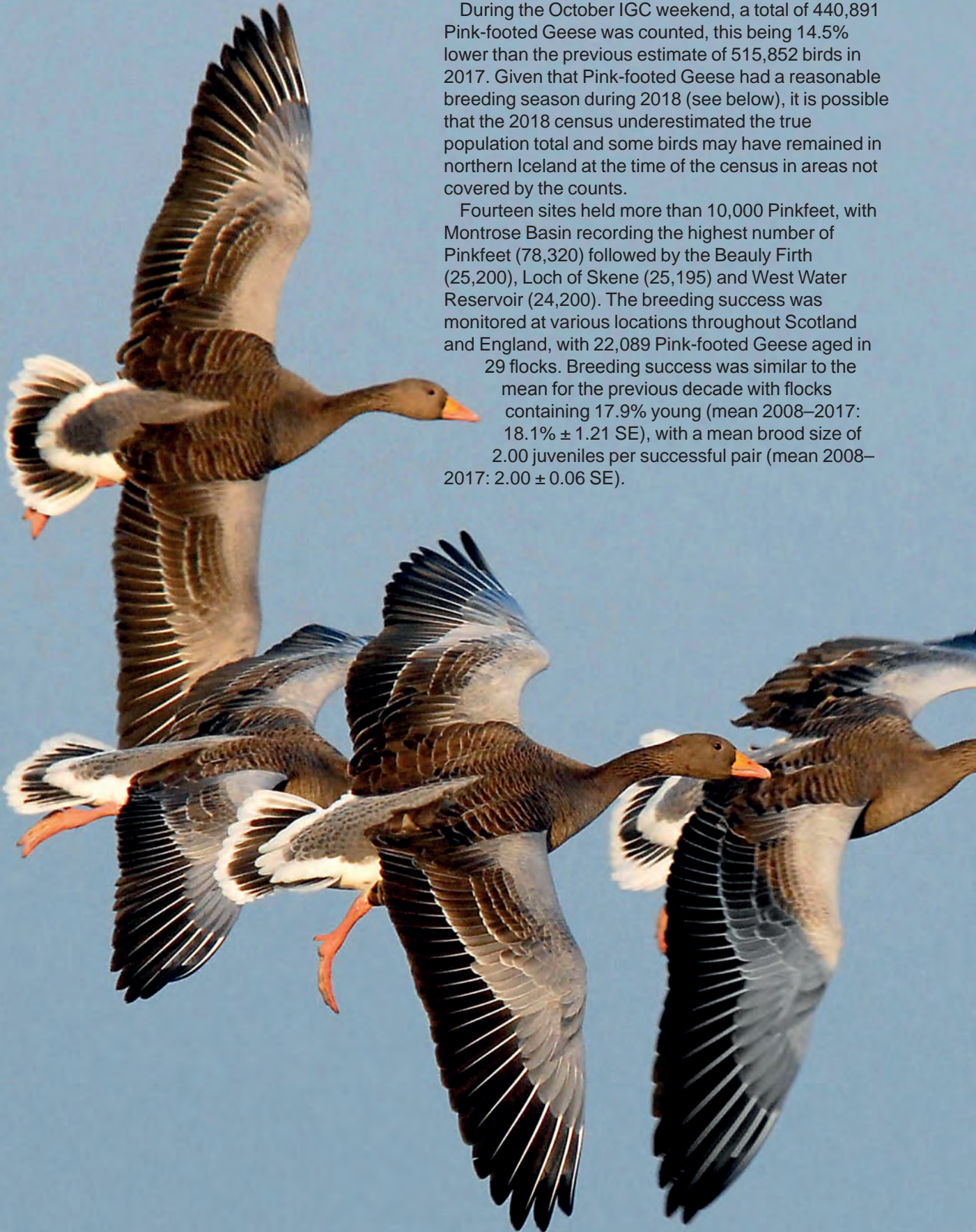
Icelandic-breeding Goose Census 2018

Kane Brides

The 59th Icelandic-breeding Goose Census (IGC) took place in autumn 2018 to assess the population size and breeding success of the Greenland/Iceland Pink-footed Goose and the Iceland Greylag Goose. Surveys took place across the flyway, with data received from Iceland, Ireland, Britain, Norway and the Faroe Islands.

During the October IGC weekend, a total of 440,891 Pink-footed Geese was counted, this being 14.5% lower than the previous estimate of 515,852 birds in 2017. Given that Pink-footed Geese had a reasonable breeding season during 2018 (see below), it is possible that the 2018 census underestimated the true population total and some birds may have remained in northern Iceland at the time of the census in areas not covered by the counts.

Fourteen sites held more than 10,000 Pinkfeet, with Montrose Basin recording the highest number of Pinkfeet (78,320) followed by the Beaully Firth (25,200), Loch of Skene (25,195) and West Water Reservoir (24,200). The breeding success was monitored at various locations throughout Scotland and England, with 22,089 Pink-footed Geese aged in 29 flocks. Breeding success was similar to the mean for the previous decade with flocks containing 17.9% young (mean 2008–2017: $18.1\% \pm 1.21$ SE), with a mean brood size of 2.00 juveniles per successful pair (mean 2008–2017: 2.00 ± 0.06 SE).



The November 2018 count produced an Iceland Greylag Goose population estimate of 58,426, which although lower, is not too dissimilar to the previous estimate of 60,962 birds in 2017. At the time of the census, 60,534 Greylags were counted on Orkney (although an estimated 18,500 of these were non-migratory British birds) with a further 10,583 recorded in Iceland. Indications of a recent population decline have been previously reported and it is interesting that the population estimate remains well below the ten-year average of 96,838 birds (2008–2017). However, monitoring this population remains challenging and it is uncertain the degree to which undercounting and other estimations affected the 2017 and 2018 population estimates. Given that c. 40,000 birds are shot in Iceland every year and the unmonitored number of birds shot in the UK is also likely to have increased recently, as a result of SNH's attempts to reduce the number of British Greylag Geese on Orkney (where Iceland Greylag Geese also occur), the trajectory of the population needs careful monitoring.

Age assessments of Iceland Greylag Geese were made at various locations in Caithness, Scotland, with 1,378 birds aged amongst 17 flocks. The percentage of young found amongst flocks (22.6%) was higher than the previous year (19.9% in 2017) and higher than the previous ten-year mean (mean 2008–2017: 21.9% ± 0.51 SE). The mean brood size was 2.08 goslings per successful pair, and lower than that of the recent ten-year mean (mean 2008–2017: 2.25 ± 0.08 SE).

We are enormously grateful to the network of counters across the flyway who support the census, and without whose continued support such coverage would not be possible.

Celebrating 60 years of the IGC

The 60th census of Iceland Greylag and Pink-footed Geese is due to take place in autumn 2019.

The first census took place in 1960, when one coordinated count was carried out in November at various locations in Britain. In the decades that followed, the census grew to include all countries along the flyway, and as of 2001 it became known as the Icelandic-breeding Goose Census (IGC).

In our next edition of *GooseNews* (due out in autumn 2020) we'll take a look back across the last 60 years of the IGC, reflecting on the changes we have seen in both the goose populations and amongst the teams that have monitored them.

All 59 IGC reports, from the first in 1960 to the latest for 2018, are available to download from the GSMP website at <https://monitoring.wwt.org.uk/our-work/goose-swan-monitoring-programme/reports-newsletter/>.



Photo: James Lees / WWT

Taiga Bean Geese wintering in Britain in 2018/19

Carl Mitchell

Monitoring of Taiga Bean Goose wintering in Britain was undertaken at the Slamannan Plateau, Falkirk by the Bean Goose Action Group and at the Yare Valley, Norfolk, by RSPB reserve wardens during winter 2018/19. At the Yare Valley, where the number of wintering Bean Geese has been declining since 1993/94, the peak count was of 21 geese on 15 December, three birds more than that recorded during the previous winter (18). The peak was short lived however, since throughout January the maximum was a group of only 15–16 birds. There have been 21 or fewer birds at this site since 2014/15, when there was a maximum count of 47 birds. Two other Taiga Bean Geese spent the majority of the winter on the east Norfolk coast in the Waxham area with Pink-footed Geese. The long and slow decline in numbers wintering in England probably reflects a decline in the overall flyway population and short-stopping of birds on the near continent.

A peak count of 241 birds was recorded at Slamannan on 6 February, 35 more birds than the previous year (206). The first Bean Goose was seen on 27 September with 40 birds recorded two days later and the last 22 birds were seen on 18 February. Breeding success was estimated from a sample of 85 birds at Slamannan in late October: four birds were aged as first winter (5% young) with a mean brood size of 1.3 young per successful pair in the three broods seen. Breeding success has been at, or below, 5% in four out of the last five years. The number of Bean Geese wintering at Slamannan has fallen from 300 birds as recently as 2007/08, but the increase in numbers in winter 2018/19 is a welcome change of fortunes. However, there appears to be a mismatch between annual breeding success and the number of birds over-wintering at

Slamannan. In winter 2017/18, 14.0% young was recorded, but numbers declined, and in winter 2018/19 there was 5.0% young and numbers increased; the opposite to what might be expected. Quite what is driving the change in numbers at the site is not clear. The surveillance may suffer from low sample sizes when determining breeding success, or there may yet be hitherto undetected connections with birds wintering in Denmark one year and in Scotland the next.

Since 2011, a number of Bean Geese from the Slamannan flock have been caught and fitted with GPS tracking devices to help explain their migration routes. The resulting data have provided some fascinating information on the birds' movements, and one of the tags is still transmitting. To follow their migration story go to <https://sites.google.com/view/scotlands-bean-geese/migration>.

The use of engraved neck collars on Bean Geese at Slamannan has also helped open our eyes to the comings and goings of the wintering flock there. They appear to be relatively long-lived, with at least five (33%) of the first fifteen birds caught in October 2011 still alive and well eight years later and regularly being seen. Some also appear to show 'extended families' with offspring from one year still associating with their parents over several winters.

Thanks to Angus MacIver (Bean Goose Action Group), Ben Lewis (RSPB) and Larry Griffin for providing data reproduced here.

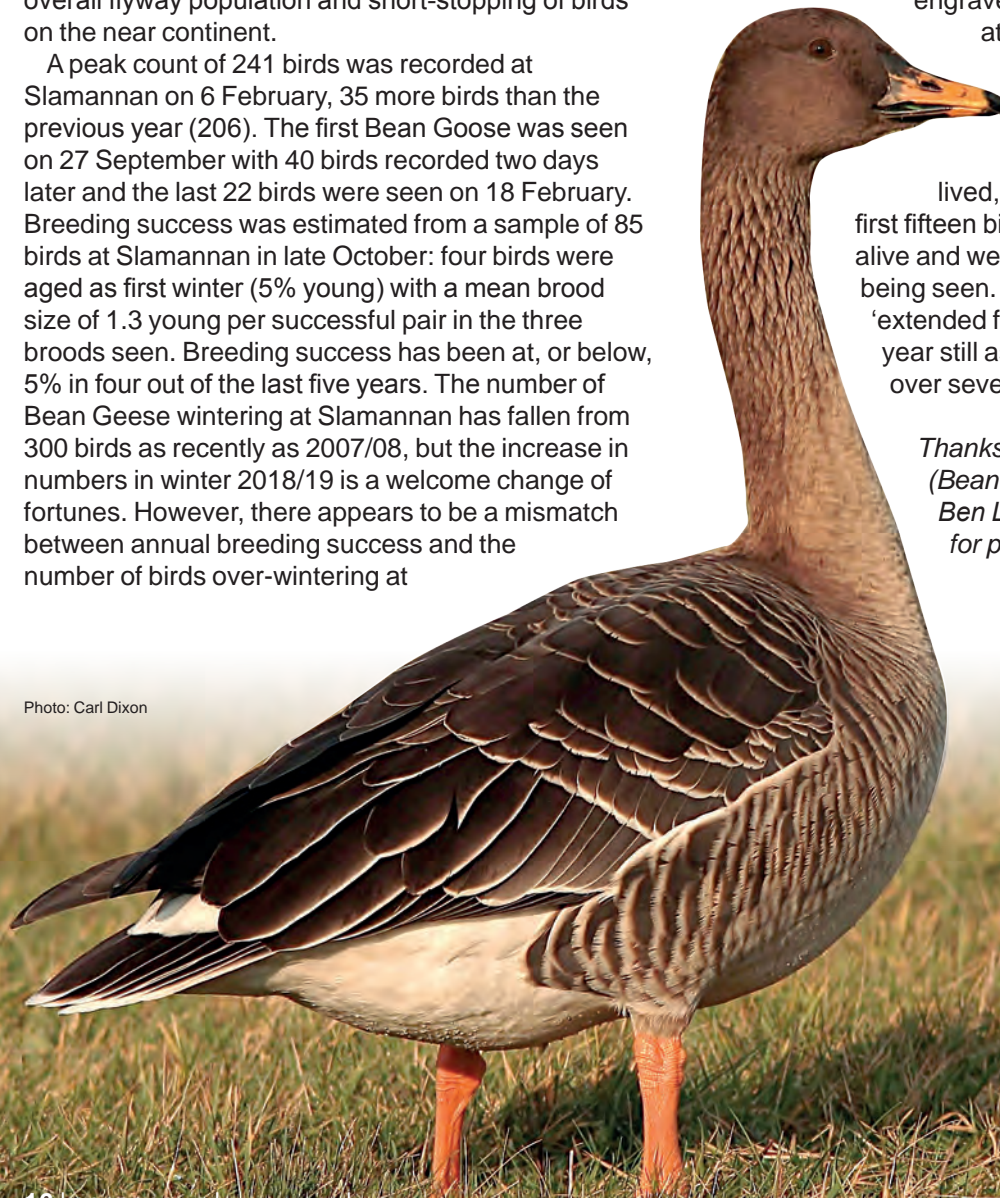


Photo: Carl Dixon



Photo: Mark Wilson

Monitoring of British Greylag Geese in key areas of Scotland in 2018

Carl Mitchell

A number of areas where the numbers of British Greylag Geese are now being reduced through shooting, in an attempt to alleviate agricultural economic damage, are monitored and provide the basis for annual reporting. However, no count or assessment of productivity was undertaken on Orkney in 2018.

On Tiree, the late August count was 1,968 geese, a 3.5% decrease compared to 2017. Breeding success was once again high with 1,428 birds aged and, of these, 40.8% were young with a mean brood size of 2.81 per successful pair. This was the thirteenth year in a row that breeding success was recorded at over 25% young and the highest value since 2001.

On Harris/Lewis, breeding success was also high with 1,392 birds aged in November 2018 of which 33.5% were young birds, and in spring 2019, 4,560 Greylag Geese were counted on the islands. Winter counts were undertaken on the Uists, where 5,571 Greylag Geese were counted in late February 2019, an increase of 13.9% on the previous year.

Thanks to John Bowler (RSPB Scotland) for providing counts and breeding success data from Tiree and to Roddy MacMinn (SNH) for providing counts from the Uists and Harris/Lewis.

Greenland White-fronted Goose population monitoring in 2017/18

Tony Fox, Alyn Walsh, Ian Francis and David Norriss

The National Parks and Wildlife Service (throughout Ireland) and the Greenland White-fronted Goose Study (GWGS; in Britain) have coordinated the annual survey of wintering Greenland White-fronted Geese each season since 1982/83. The survey aims to assess the annual abundance of the entire world population, and to this end, GWGS gratefully acknowledges funding for this task from the WWT/JNCC/SNH Goose & Swan Monitoring Programme.

The objective has always been to undertake monthly counts from November through to March (April in former times, before the geese began to advance their spring migration departure dates). However, we ask for particular efforts to be invested in December and March during nominated international count periods, from which we use the March count as the annual assessment of population size. Although this means we count the birds towards the end of their winter period in Britain and Ireland, experience has shown that their full numbers are much easier to monitor than in autumn, when some can be hidden away on remote peatland feeding areas, and in mid-winter, when they are often most dispersed.

In this task, we are as ever inordinately grateful to the loyal and steadfast army of counters that go and search out the geese to age and count for us to be able to make such an assessment. Their incredible efforts located 20,529 geese in spring 2018, which was extremely close to the count of 20,556 reported this time last year in *GooseNews* for spring 2017 (Fox *et al.* 2018), which in turn had been 9% up on the previous March 2016 count. The population continues to be rather concentrated at two major resorts, Wexford Slobs in SE Ireland (which supported 37% of the entire population in spring 2018) and the Scottish Inner Hebridean island of Islay (26%). Despite little overall change in population size, numbers at Wexford actually increased by 8.4% (from 7,047 in spring 2017 to 7,637 in spring 2018), while those on Islay fell by 13.3% (from 6,141 to 5,623) showing some redistribution within the range between winters, at least during the spring count. Numbers counted elsewhere in Ireland changed little between the two seasons (1,912 compared to 1,950), while numbers counted in Britain away from Islay increased a little in 2018 (5,623 compared to 5,456).

The lack of change in overall population size fits well with another relatively poor breeding season in 2017, based on field-sampled age ratios of geese. Amongst the geese aged on Islay, Dr Malcolm Ogilvie recorded 9.3% young among 1,920 geese sampled, which is well below the average of 13.6% for the years 1982–2016. Observers elsewhere in Britain found 11.6% young (from 2,754 birds which were age determined). Both of these

results were better than the age ratios in Ireland, with 5.3% young at Wexford (among the lowest ever recorded and well below the 12.1% average for 1982–2016) and 5.0% elsewhere in Ireland (the lowest ever recorded).

As discussed in the last edition of *GooseNews*, we think this low productivity relates to poor weather on the nesting grounds. We have known for some time that Greenland White-fronted Geese undergo a degree of leapfrog migration, so the birds that breed in the north of their range in west Greenland tend to winter in the south of the range in winter (*i.e.* in Ireland; Kampp *et al.* 1988). Geese that overwinter in Scotland are those that tend to nest further south within the breeding range in the milder parts of central west Greenland, which tend to thaw much earlier. Disko Island temperature records (from the southern edge of the breeding area used by Irish geese), show that when geese arrive to nesting areas, recent springs have been substantially colder compared to those during the early 1990s when the geese were returning with well over 10% young to Wexford and Ireland (Figure 1).

The geese stage in Iceland on their spring migration where they now spend four to five weeks acquiring fat deposits and nutrient stores for the onward journey to Greenland and ultimate investment in reproduction. However, no matter how good the level of body condition the geese can achieve on their staging areas in Iceland in spring, having crossed the inland Greenland ice cap the females still need to restore their depleted energy stores once arrived to their nesting grounds. This is necessary, not just to invest in laying a clutch of eggs, but also to maintain them through the incubation period, when we know they spend more than 99.9% incubating each day (Stroud 1981). To arrive to sub-zero temperatures and a snow-covered landscape, with no above ground green growth of forage plants and a frozen substrate, which inhibits extraction of the nutritious below-ground storage parts of plants, imposes energetic costs on geese from arrival. Arriving to temperatures above freezing enables females to acquire additional stores for egg-laying and incubation from arrival, so it seems likely that these relatively small differences in temperature on arrival may have critical consequences for the geese later in the season. As widely reported in the scientific press, temperatures are generally increasing in west Greenland, but for this critical early spring period for the Greenland White-fronted Geese, this is not the case and a protracted period of cold springs with heavier than usual snowfall has restricted their ability to reproduce at levels equivalent to the 1980s and early 1990s.

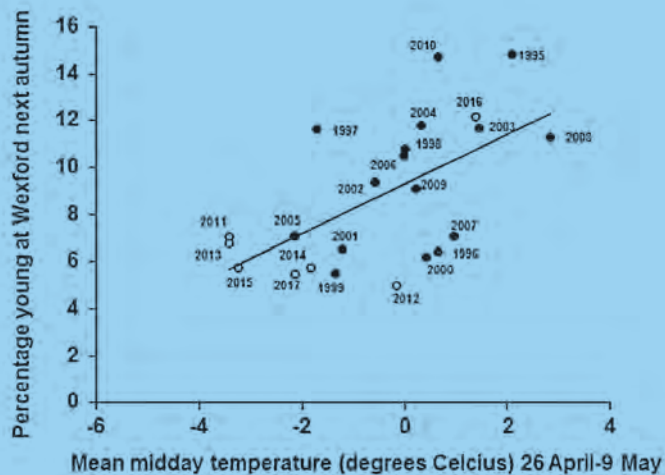


Figure 1. Plot of mean daily temperatures (taken at 12:00) at the University of Copenhagen Arctic Station on Disko Island against the percentage young geese among aged samples at Wexford Slobbs, southeast Ireland, in the subsequent autumn. Temperature data are from the online data accessible from the Greenland Ecosystem Monitoring (GEM) database (<http://www.g-e-m.dk>) and reproduced in this form with permission. Fitted regression line for all points is significant ($r^2 = 0.36$, $F_{1,21} = 11.8$, $P = 0.025$). Note all the springs since 2011 (shown as open symbols) have been cooler than average and production of young has been correspondingly low, with the exception of 2016, a warm spring when reproductive success recorded at Wexford was correspondingly high.

A moderate breeding year for European White-fronted Geese

Kees Koffijberg & Kane Brides

A total of 273,652 individuals were counted as part of age assessment counts carried out in Germany, The Netherlands and the UK from October 2018 to February 2019, revealing 12.6% young in the population. At the time of writing, data are still to be received from other areas of the flyway; however, the final assessment is expected to be close to this figure. Compared to the previous ten years, breeding success during 2018 was about average. However, as previously mentioned in *GooseNews* a long-term significant decline in breeding success has occurred.

The percentage of young in The Netherlands (15.4%) were slightly larger than in Germany (12.1%), but this is mainly due to the 19.6% young recorded in a sample of 19,535 geese in Friesland (northern Netherlands). Overall, variation between the other regions in both countries was actually very low (ranging from 10.6% to 13.2% young). In a large sample assessed in Germany, mean brood size was 1.51 young per pair (amongst 3,684 families), whilst in The Netherlands, mean brood size was 1.60 amongst the 456 families recorded: based on preliminary data.

As usual, counts in the UK yielded a much higher age ratio of 23.1% young overall. Data were collected at two sites, WWT Slimbridge (149 aged, 17.4% young) and the RSPB reserve North Warren in Suffolk (171, 28.1%). This small sample size reflects the low number

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Photo: James Lees / WWT

now migrating to the UK, but the relatively high percentage of young does fit the pattern observed in earlier years. Mean brood size was also recorded at WWT Slimbridge, with 2.46 young per successful breeding pair recorded amongst the 13 broods assessed.

European White-fronted Geese arrived rather late at their wintering sites on the continent in autumn 2018, and so was the arrival of successful families. According to long-term monthly counts in The Netherlands, total numbers around mid-October were the lowest since 2009. Initially, very few young birds were recorded in the flocks, pointing at a repetition of the low breeding success in 2017 (when a late arrival also occurred). October age assessments showed only 8.8% young birds, but after a mass arrival during late October and early November, the number of young increased to 11.7% in November and 12.8% in December and then stayed around that level for the rest of the winter.

Our sincere thanks to the networks of observers who undertook age assessments across the flyway.



Photo: Mark Wilson

Greenland Barnacle Geese wintering in Scotland in 2018/19

Carl Mitchell

On Islay, the most important wintering site in the UK for Greenland Barnacle Geese, four coordinated counts were undertaken during winter 2018/19. These revealed 30,428 birds in November, 31,263 in December, 35,251 in January and 31,058 in March. The mean of these four counts was 32,000 birds which represents a 21.9% decrease compared to the winter 2017/18 mean (40,989 geese). The over winter population there has now decreased by a third in the last three winters as a result of the management culls that are taking place (see also *GooseNews* 14:10–11).

Breeding success is measured annually on Islay and counts in winter 2018/19 revealed another poor breeding season. Just over 8,000 birds were aged and showed that just 1.1% were young with a mean brood size of 1.01 young per successful pair. On Tiree, a sample of 1,000 birds held just 14 young (1.4%) with a mean brood size of 1.08 young per successful pair. Overall, 2018 was the worst breeding season since records began in 1959. Reports from several areas in East Greenland mentioned unusually heavy snow

during spring and early summer which was still lying as late as August. For six out of the last seven years, breeding success has been below 7.0% young.

There has been a recent increase in the number of Barnacle Geese caught in this population and marked with engraved plastic leg rings. Catching has taken place in Ireland, Scotland and Iceland. With so many birds now colour-ringed, it is well worth checking flocks for marked birds. The ringing in Iceland took place during the summer moult; there are now over 1,000 pairs nesting in the south of the county near Jökulsárlón. During the winter, colour-ring sightings of these birds have been reported from several areas of west Scotland and Ireland – all within the range of the Greenland population. Thus, it looks like the birds breeding in south Iceland probably stem from the Greenland population and may have involved birds abandoning half of the spring migration.

Thanks go to Malcolm Ogilvie and John Bowler for providing age counts and SNH for providing counts from Islay.

Svalbard Barnacle Geese in 2018/19

Larry Griffin

The small Solway Goose Management Scheme area contained most of the goose activity on the Scottish side of the Solway this winter probably because of the fairly mild conditions, such that grass growth continued throughout much of the season. On moving into April 2019, warm dry conditions persisted and most of the geese left the fields and headed onto their preferred saltmarsh habitat to feed and by the second half of April birds were starting to leave for Norway. There was an abrupt end to the count season on the Solway by 15 May as less than 1,000 birds remained at a time when there can often be closer to 10,000 and by 18 May there were none (in the previous five years the average number of geese present in the period 13–18 May has been $6,700 \pm 4,800$).

Again in spring 2019, through a contract with EDF Energy Renewables Limited (managed by Arcus Consultancy Services Limited), it was possible to catch and track eight female Barnacle Geese adding to the previous six (out of eight) with transmitters still functioning since April 2018, giving 14 tracked birds in total.

It was apparent from the weather forecasts that some of the tagged geese that had left the Solway as part of the mass evening departures from Rockcliffe had faced less than ideal wind conditions on crossing the North Sea and one was lost during this period with another, ringed "HAB", getting batted further south than usual

and then trying to thread its way up through the mountain valleys and passes of southern Norway across inland areas where we have not recorded these geese before (Figure 2). This will have been due to strong northerly winds down the coast of Norway throughout 2 May when this bird started its migration and which strengthened through to 4 May. It tried to head through the mountains of southern Norway to reach the north coast staging areas of e.g. Vesterålen, mostly following sheltered valley features, though being thwarted after three attempts to cross between peaks of nearly 5,000m into a northerly wind and snow with the bird eventually making a decision to go back to a more easterly route it had tried before after spending the night on what was likely to have been a frozen lake. This bird eventually seemed to succumb after efforts to continue heading north through the mountain chain during further periods of strong northerly winds and snowstorms.

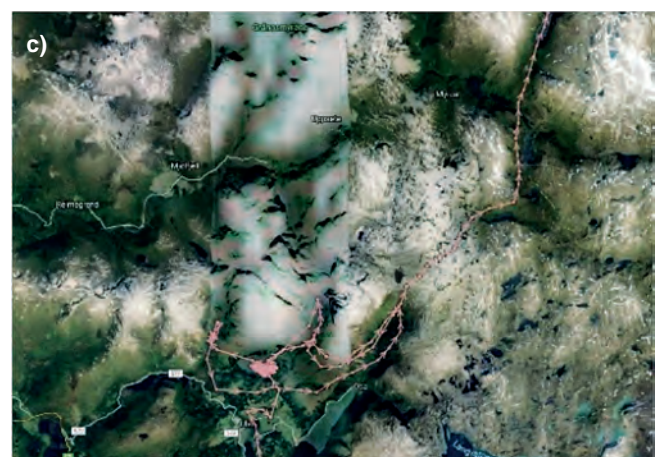
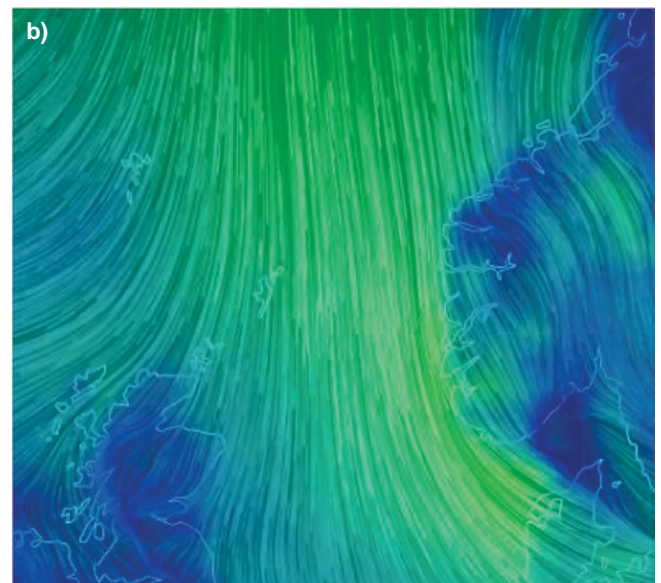
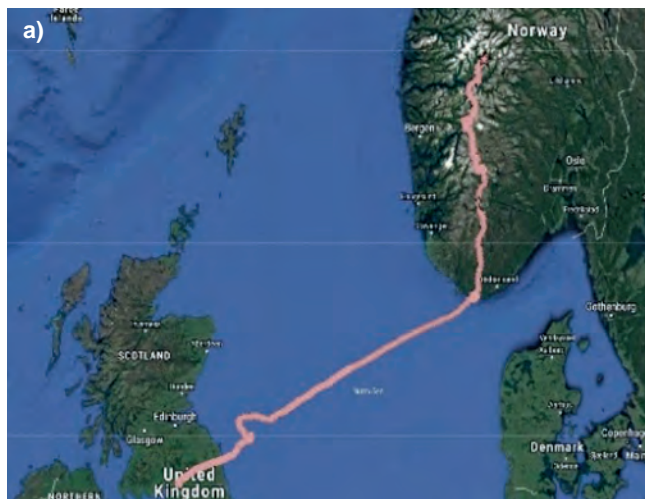


Figure 2. Migratory track of tagged barnacle goose "HAB"; see text for details: a) the full GPS track from the Solway to Norway at one second intervals; b) the northerly winds which strengthened from 2–4 May during the migration (snapshot taken from 'earth.nullschool.net', blue = calm areas, brighter green denser lines = stronger winds); c) detail of its efforts to head north through mountain valleys with roost site on frozen lake.



Photo: Mark Wilson

Of the 12 tags remaining at the traditional staging sites along the coast of Norway, one of the 2018 cohort managed to shed its tag and harness intact, being seen alive later; an act Houdini would have been proud of! As the final 11 tagged birds and their fellow geese started off north from Vesterålen from mid-May it was again clear this was going to be a very tricky time, and to an extent they were delayed in their departure, as there was a strong belt of north-easterly winds ahead of them and the welcome in Svalbard appeared to be one of sub-zero temperatures and snow until well beyond the end of May, which nowadays is quite unusual. Thus it seemed like this could be a case of sites along the flyway being out of sync with one another with the geese receiving confusing signals during the course of their migration after being baked on the Solway earlier than usual and then finding snow and ice clad breeding areas well into May on Svalbard. However, these are hardy Arctic birds so it will be interesting to see if this affects breeding success in 2019.

The tracking work carried out was even more ambitious than in 2018, and most of the new tags recorded the flight paths and heights of the geese every second from the start of their migration from the Solway until their arrival on the Norwegian coast at which point the tag batteries were mostly depleted such that the tracks north up the Norwegian coast were based on GPS fixes taken every minute. It is hard to imagine how these data can possibly be improved upon in the future as it is basically a set of continuous tracks in 3D that give full knowledge of the flyways taken.

Because these tags rely on GSM mobile phone network connections to send their data, we have not heard from the majority of birds since they presumably reached Svalbard, albeit one bird was giving updates for a week in the area around Longyearbyen.

The tagged birds were part of two cannon-net catches made with half nets on the reserve at Caerlaverock on 23 March (15 birds) and 9 April (14 birds) with three-letter orange rings in the series "FU-" and "HA-" being fitted, much to the amusement of those involved.

As mentioned in last year's *GooseNews* article, we really appreciate any reports of these leg rings and tagged birds or the increasingly "rare" collared birds among the 40,400 (the adopted Solway population total for winter 2018/19) as there are still a few collars out there even though the birds seem to be adept at removing them. For example pair "D" and "I" were recorded again this winter, though this time male "I" had lost its collar and so could only be identified by its

leg-ring orange "FPF"; this pair was first collared at Caerlaverock in April 2016 and so this represented their fourth winter together as a marked pair.

Another heartening story was the sighting of orange "FPF" and orange "FPY" together on a field by the reserve this winter. Orange "FPY" was a female fitted with a GPS tag in April 2018 and male "FPF" received collar "P" during the same catch. Strangely the GPS fixes from the tagged female showed that this pair lingered on Rockcliffe Marsh into the first week of June 2018 and when only a few tens of birds remained. When investigating further on 4 June in the severe heat haze a tiny group of about 30 birds could be seen feeding in the gullery area of Rockcliffe Marsh from a vantage point near Burgh Marsh so it looked like it could just be random luck that one of those birds was tagged. However on 11 June a black plastic collar with the white letter "P" on it was reported from Rockcliffe Marsh by the warden (an extraordinary find considering only 14 have ever been used on the birds and the size of the marsh!); the crack down the length of the collar meant that it was possible to hold out the hope that this bird was still alive and had somehow got the collar off. The GPS data showed that the tagged female departed on 6 June and continued along the normal route to Svalbard. Remarkably on 21 July a sighting came in of a single leg ringed bird on Ythan Estuary near Aberdeen, it was male "FPF" and it had indeed dumped the collar! Trouble is, it was now more than a month behind its mate in heading for Svalbard, if indeed it still planned to head there. No further reports of this bird were received and so we assumed the worst and that this bird was perhaps ill in some way. That was of course until we spotted it not only fit and well back on the Solway in winter 2018/19 but also back with its original mate "FPY", so even with the months apart and their respective "bling" they had still recognised one another and reformed their partnership.

Many thanks to the Solway census team including Lana Blakely, David Charnock, Rowena Flavell, Bob Jones, Mhairi Maclaughlan, Marian & Dave Rochester and Paul Tarling, and Joe Parker for the May Rockcliffe counts, and to Derek Forshaw for observations from Budle Bay. Thanks also to Rosie Rutherford and Val & Bob Smith for sterling efforts with the ring-reading again this winter and to all others providing updates from along the flyway but especially Johnny Bakken and Paul Shimmings. Arcus Consultancy Services Ltd, facilitated the tracking work which was appreciated.

Breeding success of Dark-bellied Brent Geese in Britain, 2018/19

Kane Brides

During winter 2018/19, 27,899 Dark-bellied Brent Geese were aged at 79 locations within 14 estuaries and coastal areas in Britain. Overall, the percentage of young present in flocks was 8.0% and of the 382 broods assessed, the mean brood size was 1.88 per successful pair. These results suggest the Brents had a relatively poor breeding season in 2018; although, neither the percentage young nor the mean brood size were much below the average for the previous ten years: $8.7\% \pm 2.45$ SE and 2.1 ± 0.13 SE, respectively.

Reports from monitoring stations in the breeding grounds in Arctic Russia during 2018 suggest that weather conditions were not ideal, with snowfall in June and strong winds adversely affecting the nesting attempts of many species of bird. The breeding season

was moderately late to start and monitoring stations reported that in some areas Dark-bellied Brent Geese did not attempt to nest at all. There is also some indication that early moult migrations were carried out by Dark-bellied Brent Geese in some areas, possibly suggesting an early finish to the breeding season and abandonment of nests as moult got underway. Fox abundance was also considered high. It is, therefore, likely that a mixture of predator pressure and weather conditions resulted in another relatively poor breeding season for Dark-bellied Brent Geese.

As always, many thanks go to our dedicated network of volunteers who help to collect age assessment data from coastal areas in Britain.



Photo: Mark Wilson

East Atlantic Light-bellied Brent Goose: status update 2018/19

Preben Clausen & Ross Ahmed

The Svalbard and North Greenland breeding population of Light-bellied Brent Goose is one of the smallest goose populations in the World, and is monitored through coordinated count efforts in the UK and Denmark, where the entire population is wintering except in severe continental winters, when hundreds of birds may also migrate to Germany and the Netherlands.

2018/19 population census

In 2018/19, population counts were undertaken in November, January and May. The November count produced a total of 9,700 birds (3,300 at Lindisfarne and 6,400 in Denmark), and the May census a total of 9,250 birds (exclusively in Denmark). Numbers in January were lower at 8,400 birds, probably because the birds dispersed to sites away from Lindisfarne in the UK, and certainly did so in the Limfjord inlet in northern Denmark. Nowadays, we usually get the best counts in autumn and spring, when the flocks tend to assemble in a few localities. Any flocks from the Netherlands and Germany are not included in this preliminary January total.

2018 – a poor breeding year

At Lindisfarne, one large sample in September only found 11 goslings (0.8%) amongst 1,393 birds aged. In Denmark, 658 birds were aged in four flocks at four localities in November, of which 2.0% were goslings. Five samples of smaller flocks at Lindisfarne in January/February resulted in 5.9% goslings out of 746 aged birds.

It is rather typical that smaller flocks hold slightly higher proportions of families, but the overall picture from all these samples is that the population in the summer of 2018 had a poor breeding season, and probably one of the poorest breeding years on record since 1980 when these annual assessments of productivity began.

New age-president in the population

On 13 January 2019, Ross photographed a Light-Bellied Brent Goose at Lindisfarne that had leg-rings; but he could not read the code. After careful inspection of the photos, ring code possibilities and exclusion of alternatives, it turned out to be orange TI, ringed by Steve Percival at Lindisfarne on 20 March 1996. The bird was ringed as a 2nd calendar-year bird; hence, born in 1995, and thus 23½ years old when it was seen by Ross. This is the oldest bird we so far have on record in the ringing database. We now have 37 re-sightings of the bird which suggest it winters annually in Lindisfarne and stages in spring in the Limfjord region of Denmark. It is unknown whether it breeds in Greenland or Svalbard, but even migrating to the nearest known breeding localities in the latter will involve 5,000 km tour/retour to the Arctic and 700 km across the North Sea annually. Hence TI has flown at least 133,500km on its long-distance migrations, and most likely another 40,000–80,000km, if one assumes it commutes five to ten kilometers per day between night roosts and feeding areas 11 months per year, being flightless four weeks each summer.



Photo: Brian Burke



Photo: Brian Burke

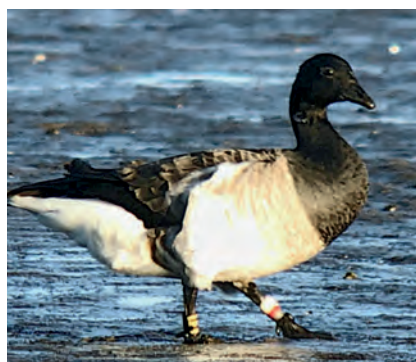


Photo: Ross Ahmed

Photo of orange TI. Although this photo (and other photos taken from slightly different angles) are blurry, they were sufficient for us to identify this bird as orange TI by excluding other possibilities of birds with white above red (and metal ring) on the left foot. Photos, digi-scoped or long-distance camera lens shoots, are often essential when we have to decipher the code on birds like this, where the engraved darvic ring on the right foot is faded, severely worn, and probably just about to crack and fall off the bird.

Zooming in on *Zostera*

The principal feeding habitat of Brent Geese at Lindisfarne is the intertidal mudflats with eelgrass (*Zostera*) beds between Holy Island and the mainland. The relatively stable extent of the *Zostera* beds at Lindisfarne, in combination with loss of *Zostera* beds in Denmark due to eutrophication, have caused an increasing proportion of the population to winter at Lindisfarne since the 1980s (Clausen & Percival 1998). In Denmark, the big surprise in the May 2019 count was the major concentration of 8,225 birds in the Nibe-Gjøøl area of the eastern Limfjord. At this site, we have seen a massive and rapid recovery of *Zostera marina*-beds in the last few years (Balsby *et al.* 2017), and we know from previous studies that the Brent Geese prefer this habitat whenever it becomes available, because it is energetically more favorable than alternative habitats. In the almost non-tidal region of Limfjord, access to *Zostera* in spring requires

extended periods with easterly winds, which force waters out of the inlet and give access to *Zostera*, and April–May 2019 had very long periods of easterlies, giving the birds this regular access to the eelgrass. This obviously caused the Brent Geese to concentrate at the site, rather than spreading out to alternative sites, where they, to a larger extent, have to resort to alternative feeding habitats on salt marshes. The May count is the highest number on record in Nibe-Gjøøl, and such numbers have not been seen there since before the 1930s, when the so-called wasting disease wiped out *Zostera* in this and most other sites around the North Sea. Back in the 1930s, we know that local fisherman shot hundreds of Light-bellied Brent Geese specifically in the Nibe-Gjøøl area each spring, and that *Zostera* was so common that it was harvested, rinsed in freshwater and dried in the sun, and used to stuff mattresses. Although the recovery of *Zostera* beds in the Limfjord is still far from previous known distributions, it is interesting to see how improved water quality in recent years has opened up areas for recovery in some parts of the Limfjord. These observations pinpoint how continued efforts on waste water treatment and reduction of agricultural nutrient runoff is essential to secure this key habitat of the Brent Geese.

Thanks

Age counts in Lindisfarne and Denmark were undertaken by Steve Percival, Andrew Craggs, Henrik Haaning Nielsen and Lars Tom-Petersen, and population censuses by several observers, all of which we acknowledge for their continued efforts in the field.

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Capture and marking round-up

Kane Brides, Larry Griffin, Graham McElwaine, Carl Mitchell, Steve Percival and Paul Roper

Whooper Swan

During August 2018, Sverrir Thorstensen caught 30 Whooper Swans around the Bárðardalur area of northern Iceland, consisting of 22 newly colour-marked birds and eight recaptures from previous years.

Unusually, two pairs of Whooper Swans bred at WWT Welney in Norfolk raising five young (brood of two and a brood of three) in total. During October 2018, these cygnets were captured and colour-ringed and later joined the over-wintering Iceland population around the Ouse Washes. Subsequent sightings of these birds since have shown that some of these cygnets did indeed commence migration northwards, with yellow ZAN photographed flying north over Bempton Cliffs in East Yorkshire on 24 May 2019, before being sighted at Montrose Basin, Angus with its sibling yellow ZAH on 07 June 2019. A bird from a different brood (yellow ZAB) was sighted at Lady Bank in Fife on 09 June 2019. Although perhaps a delayed start to their northwards migration, it will be interesting to learn of any sightings of these individuals in Iceland in future years. Indeed the capture and colour-marking of UK-hatched Whooper Swans is a rare event and so having these individuals marked will hopefully provide a useful insight into their future movements.

During winter catches at WWT centres, 194 Whooper Swans were captured and colour-marked at WWT Martin Mere, Lancashire and WWT Caerlaverock in Dumfries and Galloway. Sixty-five birds were caught at Caerlaverock consisting of 25 newly ringed birds and 40 recaptures, with 129 birds captured at Martin Mere of which 85 were ringed for the first time and 44 were recaptures.

Bewick's Swan

In August 2018, a team from WWT joined Russian colleagues on an expedition to the Pechora Delta region of the Arctic Russian tundra to catch Bewick's Swans. Although at times hampered by bad weather during the course of the expedition, a total of 60 Bewick's Swans were captured and colour-marked with white and yellow leg rings, consisting of 50 newly colour-marked birds and ten recaptures from previous expeditions. A smaller number of Whooper and Mute Swans were also ringed; unlike the Bewick's Swans, these birds belong to populations that do not migrate to the UK, but will likely winter in the Baltic States and Germany. The expedition would not have been possible without the help and active participation of

Russian colleagues from the Nenetskiy Nature Reserve, who have been protecting this important breeding and moulting area for the swans and many other waterbird species since the area was designated as a National Nature Reserve.

Winter catches took place at WWT Slimbridge in Gloucestershire where eight newly ringed birds and seven recaptures were caught using the swan pipe. A cannon-net catch in Littleport near the Ouse Washes in January 2019 captured nine Bewick's Swans of which all were newly ringed. Several of these birds were fitted with GPS tracking devices to follow their migrations over the North Sea in relation to offshore windfarms.

Our thanks go to Alison Bloor, Steve Heaven and Ailsa Hurst for their help in assisting with the computerisation of thousands of sightings of colour-marked Whooper and Bewick's Swans.

Dark-bellied Brent Goose

Following the successful catch of 18 Brent Geese in January 2018 a second catch of 14 birds were caught at the same site, Blue House Farm on the Crouch Estuary in Essex, in January 2019.

All 14 birds were colour-ringed, with five birds also fitted with neck collars carrying GPS tracking devices. All 14 geese have since been re-sighted at least once mostly by David Low at Blue House Farm, with four of these birds having also been sighted in the Netherlands and Germany in early spring. Of the 18 geese ringed in 2018, six have been re-sighted back in the UK during the 2018/19 winter. Interestingly one of these birds, Green AN, was seen in the UK on 10 October 2018 but then from 28 January 2019 to 2 February 2019 was at Havre de Regneville in France suggesting it winters on the northwest French coast. This bird was also then seen at Hollum in Netherlands on 1 April 2019.

The use of GPS tracking devices on these birds has provided an interesting insight in to the daily movements of these birds within the Crouch Estuary and shown how incredibly faithful these birds are to the grazing fields at Blue House Farm and within a 7km range of either side of the river.

All birds that were tracked migrating from the UK to the first staging area carried this out during the night. Most of the birds took around six hours to carry out the 300+ km journey to the Dutch coast. All three left the Crouch Estuary around 10pm and spent up to three

hours just off the coast of the UK at Foulness, before leaving around midnight and flying direct across the North Sea in a shallow curved line towards the NW coast of The Netherlands. All three seemed to take an almost identical route. One bird staged in The Netherlands and two in Germany. What has also become clear is that at each staging ground, the home range is also quite small and birds are faithful to very small areas.

We hope that the transmitters will continue to transmit over the coming months to give further information on timing and the routes taken during onward migrations in the hope that we are able to track these birds to the breeding grounds.

East Canadian High Arctic Light-bellied Brent Goose

After a winter off, goose catching saw a return to action in County Dublin, when two periods of concentrated effort, in December 2018 and then again in January 2019, resulted in 148 birds being caught in ten successful attempts. Forty of these geese were fitted with temporary mounted GPS tags, as part of a study of urban usage around Dublin.

In Wales, the SCAN Ringing Group were again in action in February 2019, with 28 geese being caught and colour-ringed at Penmon on Anglesey.

A very late set in April 2019 resulted in a further significant catch of 103 birds in Northern Ireland, at Myroe Levels on Lough Foyle. For the first time in six years, no attempts were made to catch geese on the staging grounds in Iceland in spring 2019.

The overall ringing total for the season of 279 geese was, however, very similar to numbers achieved in recent years.

Re-sightings of marked birds has continued apace. Most notable, perhaps, was a second marked bird being recorded from Galicia in Northwest Spain (the other bird was recorded in winter 2016/17). Overall statistics on re-sightings are more difficult to report this year, as the database has been undergoing a transition towards an online system for data reporting and feedback. This has been instigated as a result of the large (10,000–15,000) number of records being received annually, in an attempt to reduce the associated administrative burden. As the old database has been closed for new entries since the end of last season, particular thanks go to those core observers who, through the season, have continued to constant-effort ring-read and temporarily store their records in the absence of timely feedback. It is also recognised that feedback given to new and less frequent observers has often been incomplete. Hopefully this situation will be rectified soon, following which all observers in the 2018/19 season will be contacted individually with details of how to access the new system.

As usual, many thanks go to the cannon-netters and to all the support teams of volunteer helpers and ring-readers.

Photo: Steve Percival

Greenland Barnacle Goose

Five cannon-netting catches were made on Islay during winter 2018/19, with a total of 117 new birds marked and 14 recaptures. The recaptures included the oldest known ringed bird alive in the population at the moment, white LBL, who was ringed as a juvenile back in November 1994 so is now 24 years old. He's probably now flown over 150,000km in his lifetime! Catches were also made on the Inishkea Islands, Co. Mayo (30, plus two Todd's Canada Geese), at Malin in Donegal (83) and at Lissadell in Sligo (73).

A total of 4,400 sightings were made over the winter, with excellent coverage of many major haunts including Islay, Tiree, Lissadell, Malin/Trawbreaga, Oronsay/Colonsay, Inishkea and the Uists. Many thanks to all who submitted sightings.

Recent catches and re-sightings have established a strong link between Islay and wintering sites in Donegal, as well as with Tiree and Oronsay/Colonsay. All are providing very useful data that will help understand the population-scale impacts of the Islay goose cull, as well as contributing to the long-term monitoring of this population.

Svalbard Barnacle Goose

During two catches at WWT Caerlaverock in Dumfries and Galloway, staff and volunteers successfully managed to cannon-net 29 Barnacle Geese as part of long-term monitoring of the species and to fit various tracking devices to follow migration routes.

The catches consisted of 28 newly ringed birds and one recaptured bird which was originally ringed on Svalbard in August 2009 as a gosling female.

Greenland White-fronted Goose

Four cannon-net catches were undertaken by WWT during winter 2018/19: three on Islay resulted in 23 newly colour-marked birds, whilst nine new birds were ringed at West Freugh (Dumfries & Galloway).

Further information on how to submit sightings of colour-marked geese and swans can be found on page 4.



Conservation and research news

Thank you David Stroud

After an incredible 33 years at JNCC (and the Nature Conservancy Council before that), David Stroud has moved on to pastures new to continue the fight to preserve our shared migratory waterbirds and the wetlands that support them.

It is no exaggeration to say that the GSMP, and waterbird monitoring in general, would not be what it is today without David's enormous support and commitment over four decades. The suite of waterbird monitoring schemes in the UK is, in many ways, an exemplar of how to collect and utilise monitoring data for waterbird conservation, and this would not be so without the vision David has shown to shape these schemes and ensure they are as policy relevant as possible.

David is a humble human who shies away from effusive displays of gratitude, so simply and sincerely, thank you David.

The 19th Goose Specialist Group Conference

The 19th conference of the Goose Specialist Group will be held in Leeuwarden, in the province of Friesland in the Netherlands, from 28–31 January 2020. The conference is being organised by the Netherlands Institute of Ecology, the Dutch Centre for Avian Migration and Demography, and Sovon Dutch Centre for Field Ornithology.

Abstracts for talks and posters can be submitted via the conference website at <https://www.sovon.nl/nl/gsg2020> where further information, including the programme, costs and registration, will also be made available.

Revising estimates of wintering waterbird numbers

Every so often, approximately every six years, estimates are updated of the sizes of different waterbird populations wintering in Britain. These estimates might seem a little uninspiring to some, but actually they are an important conservation tool. They provide crucial information for the implementation of international conservation obligations, including, most importantly, the identification and protection of wetlands of national importance. The latest estimates were recently published in *British Birds* and are available to read in full at <https://britishbirds.co.uk/wp-content/uploads/2019/07/Brit.-Birds-112-130-145.pdf>.

The majority of these estimates are based on data from the BTO/RSPB/JNCC Wetland Bird Survey (WeBS), augmented by other more specialised waterbird monitoring schemes, including the GSMP, the Non-estuarine Waterbird Survey (NEWS) and the Winter Gull Roost Survey (WinGS), as well as county bird reports and other sources.

The estimated total number of wintering waterbirds in Britain is 12.8 million, including 4.9 million waders, 3.8 million gulls, 2.1 million ducks, 1.1 million geese, 500,000 rails, 170,000 cormorants, 70,000 swans,

60,000 herons, 30,000 divers and 30,000 grebes. Although changes in population estimates do not necessarily equate to the population trend, since some improvements in the way the estimate is calculated may have been incorporated, it is noteworthy that since the previous estimates, published in 2011, the total number of geese in Britain has increased by 175,000 birds, whereas the total number of waders has decreased by 142,000, reflecting the population trends of most (but not all) species in these taxonomic groups. Of course some geese, notably Greenland White-fronted Goose, have declined whilst some shorebirds, such as Avocet, have increased significantly.

As with most other bird monitoring activities, these estimates would not be possible without the huge support provided by volunteer counters who collect the data. The organisations coordinating these schemes and using the data to better protect our waterbirds and wetlands, including WWT, remain indebted to each and every one of you for your contribution.



Photo: Ed Burrell



Sixth International Swan Symposium

Eileen Rees & Leho Luigujõe

The international swan symposium (ISS) held at Slimbridge in the UK in 1971 first brought together researchers and conservationists to discuss the status of the world's swan populations, and the IUCN SSC Swan Specialist Group (SSG) has held its international swan symposia at c. ten-year intervals ever since. During the 5th ISS at Eaton, Maryland, USA, during February 2014 (see *GooseNews* No. 13), however, it was decided that the gaps between symposia were too great and that the group should meet at more frequent (five-yearly) intervals. It is therefore particularly gratifying that the 6th ISS, expertly hosted by the Estonian University of Life Sciences in Tartu, Estonia, took place just four years later from 16–19 October 2018.

As with previous swan symposia, delegates came from across the globe, with a total of 98 scientists attending from 17 different countries (Belgium, Belarus, China, Denmark, Estonia, Finland, Germany, Hungary, Iceland, Latvia, Lithuania, Netherlands, Poland, Russia, Sweden, UK and USA), and information on swans in most of these countries was presented during the meeting.

Talks ranged from latest information on the results of long-term monitoring programmes (e.g. the international censuses of migratory swans in Europe, Mute Swan counts for Sweden and monitoring of yellow-billed swans in Estonia), to conflict issues (e.g. the increase in non-native Mute Swans in North America), and use of novel techniques. The latter included exciting new information on the migration routes of Bewick's Swans tracked in the East Asian flyway, and also on habitat changes (identified by analysing core samples) in the swans' breeding areas since the mid-20th century. The plenary talk reviewed current knowledge on the conservation status of the world's swan populations, which are mostly increasing, but major gaps in knowledge were identified. It was particularly pleasing to hear from the "next generation" of swan researchers, with five PhD students (two from UK, one from Netherlands, one from China and one from the USA) giving updates on their studies.

Two workshops were also held during the 6th ISS. The first, on swan monitoring programmes, resulted in a set of recommendations for future monitoring work particularly in Europe, as it was noted that assessments of trends in numbers and total population size are undertaken regularly in North America. The main milestone is to undertake the next international swan census in mid-January 2020 (see page 5), with census dates thereafter to be considered in conjunction with EU and AEWA reporting schedules. The second workshop devoted a full day to the implementation of the International Single Species Action Plan (ISSAP) for the NW European Bewick's Swan population, which was adopted by the African-

Eurasian Migratory Waterbird Agreement (AEWA) in 2012 and is to be reviewed in 2022. The morning was devoted to presentations on progress to date on implementation of the ISSAP, whilst the afternoon was a discussion session, with members of the Bewick's Swan Expert Group (BSEG) developing a rolling work programme for taking the Action Plan forward over the next 4–5 years.

Two films were shown during the conference – the beautiful "*The Wind Sculpted Land*" film on Estonian wildlife throughout the year and also the "*Mystery of the Missing*" film resulting from the *Flight of the Swans* (FotS) project. At the conference dinner, we were honoured to have the renowned Estonian folk musician Juhan Uppin play the Estonian harmonium for the dancing, including a Ukuaru waltz by the Estonian world famous composer Arvo Pärt.

During the mid-conference excursion to Lake Peipsi, about 1,200 Bewick's Swans were seen along the shore, including several colour-marked birds from Dutch, Belgian and British ringing programmes. We were incredibly lucky with the weather and had a glorious day, with many other species also sighted. Those fortunate enough to join the post-conference excursion visited the wealth of Estonian habitats ranging from raised bogs to woodland meadows (which yielded Black Woodpecker and Crested Tit) and coastal bays, most notably the Matsalu Bay SPA and Ramsar site where the GPS-tagged Bewick's Swan named "Pola" was identified with her mate "Pyotr".

The success of the 6th ISS would not have been possible without the full cooperation of the conference organisers: the Estonian University of Life Sciences, the Estonian Ornithologists Society, the SSG and WWT. We are particularly grateful to the University for the help and facilities provided. Plans are now well underway to publish several papers from the symposium as a special issue of *Wildfowl* (Wildfowl Special Issue No. 5), and these should be available on the *Wildfowl* website (<http://wildfowl.wwt.org.uk/>) later on this year.



Photo: John Whitting

The GSMP partnership

The Goose & Swan Monitoring Programme (GSMP) monitors the abundance and breeding success of the UK's native geese and migratory swans during the non-breeding season. GSMP is organised by WWT in partnership with JNCC and SNH.

The members of the GSMP Steering Group in 2018/19 were Colette Hall (WWT), Richard Hearn (WWT), Kirsi Peck (JNCC) Anna Robinson (JNCC), David Stroud (JNCC) and Simon Cohen (SNH).

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Information in *GooseNews* is compiled from a variety of sources and does not necessarily reflect the views of WWT, JNCC or SNH.

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