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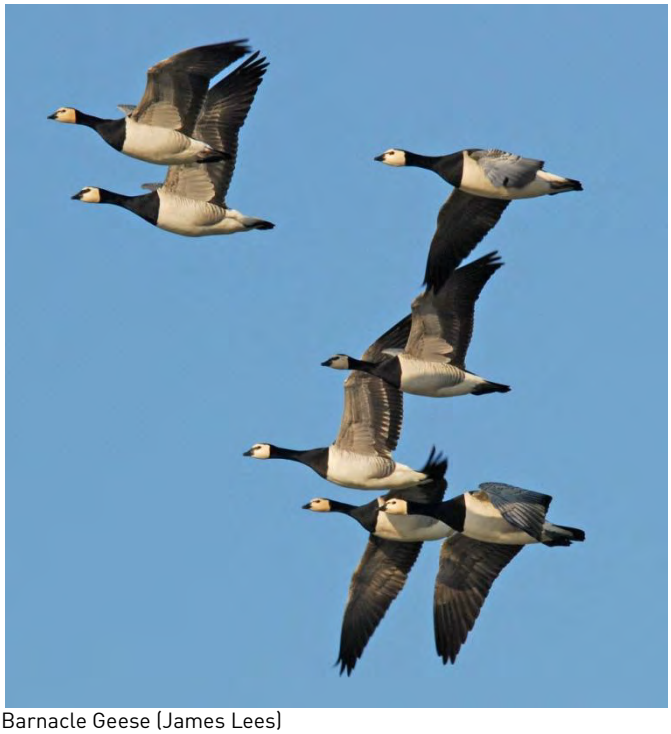
GooseNews

The newsletter of the Goose & Swan Monitoring Programme
Issue no. 12, Autumn 2013

Adaptive management of goose populations

Two articles in this edition of *GooseNews* introduce plans for managing two goose populations that are in conflict with agricultural economic interests. In northwest Europe, the population of Pink-footed Goose that migrates from breeding grounds in Svalbard to wintering areas in Denmark, The Netherlands and Belgium, will be subject to population regulation. A strategy and the actions needed to implement an International Species Management Plan (ISMP) for the population, published by the African-Eurasian Waterbird Agreement (AEWA), were agreed at a meeting in Copenhagen in April 2013 (see page 25). The ISMP is the first European adaptive flyway management plan, and will therefore act as a test case for this approach. It sets out to manage a huntable population potentially threatening sensitive ecosystems on its breeding grounds in Svalbard, and causing conflicts with agricultural economic interest, whilst ensuring that the population maintains its favourable conservation status. The plan details a number of objectives aimed at collaboratively managing the size of the population following the principles of adaptive management. The process involves a three-year, adaptive cycle of decision making based on sound demographic monitoring and modelling of population dynamics.

In Scotland, Scottish Natural Heritage (SNH) has embarked on pilot trials of population regulation of British Greylag Geese. The shooting of Greylag Geese, in addition to wildfowling, has been carried out on the Uists and Tiree for several years in response to claims of agricultural damage and, from late summer 2012, this was extended to Orkney (see page 5). SNH has also appointed an officer to make recommendations for sustainable goose management on Islay. Currently, up to



Barnacle Geese (James Lees)

2,300 Greenland Barnacle Geese are shot there each year. Furthermore, in winter 2012/13, for the first time in nearly 20 years a licence to shoot a small number of Svalbard Barnacle Geese on the Solway was issued.

The future conservation and management of geese seems dependent on developing integrated management strategies for each goose population. These should be appropriate to the conservation status of the goose population and the nature and scale of the problems encountered. Such strategies should pay due attention to the needs of individual farmers by seeking to transfer the costs of conservation to society as a whole and perhaps by allowing farmers to derive an income from supporting geese on their land and thus helping to manage and conserve goose populations for the future.

This issue also includes an update on the continued use of lead in ammunition and apparent consequent effects on wildfowl (see page 4) as well as details of progress on some current ringing projects. Results of the annual population updates have been summarised in a table, together with brief individual round-ups. As ever, we are extremely grateful for the continued support of the counter network in providing the counts, age assessments and colour-ring sightings which forms the basis of the GSMP. Without your support, there would be no results to share.

Carl Mitchell

Contents

Survey dates for 2013/14

Icelandic–breeding Goose Census

After consultation, the following dates were chosen for coordinated counts in autumn/winter 2013:

12/13 October, 9/10 November and 7/8 December 2013

Please remember that, ideally, all sites supporting Pink-footed Geese should be covered during the October and November counts, whilst those holding Iceland Greylag Geese should be counted in November and December. There are still a small number of sites where both species occur. In these cases, please try to count in all three months, but if this is not possible please discuss the best way ahead with your Local Organiser, if you have one, or the National Organiser, Carl Mitchell (see page 28 for contact details).

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

As usual, we would like to encourage all counters to also carry out a count during September at those sites where British Greylag Geese occur. September counts are not strictly coordinated but should be carried out during the middle of September, although any counts made during the month will be of value (see page 8 of *GooseNews* 2, for further details – available to download from WWT's website at http://monitoring.wwt.org.uk/our-work/uk-waterbirds/goose-swan-monitoring-programme/reports-newsletter).

We are working towards an online submission of IGC count data (see page 11), which will be available for entering data from the 2013 season; we will inform counters when it is up and running.

Counters are reminded that IGC counts should be submitted as soon as possible after the last count date; which for the autumn/winter 2013 census means after the December count. This helps speed up the collation of counts and production of results for the website and *GooseNews*.

Greenland White-fronted Goose Census

The counts dates for the coming season will be:

14–18 December 2013 (autumn international census)
15–19 March 2014 (spring international census)

Other preferential dates:
16–20 November 2013; 11–15 January 2014; 8–12 February 2014 and 1–5 March 2014.

The census is organised by the Greenland White-fronted Goose Study (http://greenlandwhitefront.org/). Please contact the organiser Tony Fox (see page 28 for contact details) for further details about the census.

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 (http://blx1.bto.org/euring/main/index.jsp).

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 http://monitoring.wwt.org.uk/our-work/uk-waterbirds/goose-swan-monitoring-programme/colour-marking.

Age assessments

Age assessments will continue during 2013/14 as usual. The survey periods vary between species and are shown below.

Population	Period	Notes
Whooper Swan	Oct – Jan	
Bewick's Swan	Nov – Feb	
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	

Announcements

Fifth International Symposium of the Wetlands International / IUCN SSC Swan Specialist Group

The fifth international symposium of the Wetlands International / IUCN SSC Swan Specialist Group (SSG), being hosted by the Trumpeter Swan Society (TTSS), will be held at Easton, Maryland, USA, from 3–6 February 2014. Swan symposia to date have been held at *c.* ten-yearly intervals, with the first at WWT Slimbridge, UK in 1971, the second at Sapporo, Japan in 1980, the third at Oxford, UK in 1989, and the most recent was held at Airlie, Virginia, USA in 2001. The 5th symposium will feature three days of contributed scientific papers, posters and workshops, with a one day excursion on the second or third day of the meeting. The talks will cover all aspects of swan ecology and sessions will be grouped in accordance with presentations offered for the meeting, but with a focus on the following topics:

- Migration strategies
- Adaptation to changing environmental conditions
- Threats faced by swan populations
- Long-term population trends and distribution
- Policy and management of swan populations

Workshops will also be convened to discuss specific conservation issues. These will likely include illegal shooting, lead poisoning, population status and management, and the implementation of the AEWA Bewick's Swan Single Species Action Plan.

Becky Abel (Associate Director of TTSS) and John Cornely (Executive Director of TTSS) are co-chairs of the host committee and, along with Local Committee chair Jerry Serie, will supervise local arrangements. Eileen Rees (WWT) is Scientific Coordinator for the meeting, responsible for structuring the scientific programme in consultation with Scientific Committee members: Bart Nolet, Chris Perrins, John Cornely, Ma Ming and Scott Petrie. Further information, including the call for papers, can be found on the TTSS website (http://www.trumpeterswansociety.org/2014-conference.html) and on the SSG pages of the Wetlands International website (http://www.wetlands.org/Aboutus/Networkspartnersanddonors/Networkofspecialists/SwanSpecialistGroup/tabid/198/Default.aspx). A provisional programme should be available in autumn 2013, and finalised by January 2014.

John Cornely, John O Albertsen and Eileen Rees

Goose & Swan Monitoring Programme Conference/Workshop

In order to provide greater contact between WWT and Goose & Swan Monitoring Programme (GSMP) contributors, and a chance to get together to discuss GSMP issues, a one day conference/workshop is being planned for September 2014.

The location has yet to be decided but it is likely to be held in central Scotland. A provisional programme will be available in early 2014 and further announcements and information will be available on the WWT website (http://monitoring.wwt.org.uk).

Carl Mitchell

GSG *Goose Bulletin* 16 published

The *Goose Bulletin* is the official bulletin of the Wetlands International / IUCN SSC Goose Specialist Group (GSG). *Goose Bulletin* appears periodically, but at least once a year, in electronic form; PDF versions of issues 6 to 16 are available to download at http://www.geese.nl/gsg/ (then click on the *Goose Bulletin* link).

The bulletin aims to improve communication and exchange information amongst goose researchers throughout the world. It publishes contributions covering goose research and monitoring projects, project proposals, status and progress reports, information about new literature concerning geese, as well as regular reports and information from the Goose Database.

Contributions for *Goose Bulletin* 17 are welcomed from all interested goose researchers and should be sent as a Word file to the Editor-in-chief, Johan Mooij (johan.mooij@bskw.de).

Johan Mooij

Whooper Swans (Sean Gray)

Lead poisoning of waterbirds in Britain

Lead is a highly toxic metal well known to be an important cause of illness and death in waterbirds around the world. In Britain, the phenomenon of lead poisoning due to lead ammunition has been well studied since the 1960s and reported in many species of waterbird. It may come as a surprise to hear that birds are still being poisoned in our own backyard. The vast majority of shot fired from shotguns falls into the environment from where it is not retrieved. As a consequence, where lead shot is used, this is responsible for most of the primary lead poisoning of birds. The birds ingest this lead shot, probably mistakenly for food items or for grit which is used to aid digestion. There is thought to be no safe level of lead and it can affect virtually all body systems once it is ingested and absorbed into the blood stream. Those who have had the misfortune of witnessing a lead poisoned bird would agree that it is a distressing sight. Many become emaciated, have convulsions and diarrhoea and lose their ability to walk.

The risk to birds from poisoning from lead shot has resulted in many countries imposing legislative restrictions on its use. For example, the use of lead shot has been banned for all shooting in The Netherlands since 1993, in Denmark since 1996 and in Norway since 1995. There are various restrictions on the use of lead in the UK: in England and Wales, lead is banned for shooting over the foreshore and specified (wetland) Sites of Special Scientific Interest (SSSI) and for hunting wildfowl, coot and moorhen in all areas, while in Scotland and Northern Ireland, lead shot is banned for hunting over wetlands (for any type of shooting activity) (HMSO 1999, 2002a, 2002b, 2003, 2004, 2009).

These are all positive steps. However, despite these restrictions, a recent study has shown that lead continues to poison and kill waterbirds in Britain with 34% of 285 birds tested at four sites during the 2010/11 winter having elevated levels of lead in their blood (Newth *et al.* 2012). Birds were caught and tested in mid-winter to reflect recent exposure to lead within Britain rather than abroad (results showed exposure within the last 35–40 days of testing and the majority of birds had arrived on British shores in the autumn). Additionally, the disease was responsible for the deaths of one in ten waterbirds found dead over the last four decades (2,365 birds were analysed from 14 species recovered at sites across Britain), with no measurable changes following the introduction of legislation (Newth *et al.* 2012). Many birds dying of lead poisoning in Britain are likely to have ingested lead in Britain. Poisoned birds often die within three weeks (De Francisco 2003) and sometimes within a few days of shot ingestion (Beintema 2001) and affected birds may be less able to successfully migrate long distances. As an 'invisible' disease where poisoned birds may become reclusive and die unnoticed in isolation before being predated or scavenged, these results are likely to underestimate the true scale of the problem.

So why are waterbirds still suffering from lead poisoning? It is likely that some birds ingest lead that is illegally shot. A recent study found compliance with the restrictions in England to be poor with 70% of 492 ducks (including Mallard, Wigeon and Teal) sold by game suppliers being illegally shot with lead

Lead shot inside a bird's gizzard (U. S. Geological Survey/ Milton Friend).

between 2008 and 2009 (Cromie *et al.* 2010) representing no apparent improvement since a similar finding in 2002 (Cromie *et al.* 2002). Some birds may also ingest lead that was historically deposited, although this shot may become increasingly inaccessible over time as it sinks into the substrate (the rate of sinking depends on local conditions). And of course, it is still legal to shoot with lead in areas accessible to waterbirds.

Geese and swans are particularly susceptible to lead poisoning with 43% of 177 tested Whooper Swans found to have elevated blood lead levels in the 2010/11 winter (Newth *et al.* 2012). Lead also caused the death of 27.3% of 414 Whooper Swans recovered in Britain between 1971 and 2010, 23% of 101 Bewick's Swans and 16.7% of 54 Canada Geese (Newth *et al.* 2012). It is perhaps not surprising that lead poisoning affects grazing geese and swans given that they commonly forage on agricultural land, over which it is legal to shoot game birds with lead shot (with the exception of wetlands and specified SSSIs, depending on UK country-specific legislative details). During the 2010 International Swan census, the majority of Whooper Swans were recorded on pasture (51.2%) and arable land (37.5%) during the daytime, with relatively few seen on permanent standing water (Hall *et al.* 2012).

It is for these reasons that WWT would encourage shooters to consider substituting their lead shot with non-toxic shot when shooting over *all* areas, including terrestrial habitats. This would reduce the contamination of our environment with a toxic substance and reduce the availability and exposure of this poison to waterbirds. Lead shot may take tens or hundreds of years to breakdown and so can remain accessible to feeding waterbirds long after deposition. Switching to non-toxic shot now would help safeguard generations of British waterbirds in the future.

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Julia Newth and Ruth Cromie

Coordinated management of British Greylag Geese and agricultural impacts

Background

In recent years, Greylag Geese breeding in Scotland have expanded rapidly in certain areas leading to conflicts with agricultural activity where goose density is greatest. Numbers have increased steadily and, by 2008/09, had reached *c.* 47,000 birds (Mitchell *et al.* 2011). Population increases have been particularly dramatic on some Scottish islands, with the population in Orkney rising from *c.* 10,000 birds in 2008 to *c.* 21,000 in 2012 (an annual increase of *c.* 19%). On the Uists, the population has increased from *c.* 150 birds in 1986 to *c.* 9,000 in 2012. These increases are thought to be due to a combination of a reduction in predator numbers, improved grazing, reduced shooting and mild winters.

Work to address the conflicts caused by geese and agriculture is being developed at a flyway scale under the African-Eurasian Waterbird Agreement. The adaptive management of the Svalbard population of Pink-footed Goose is being used as a test case to address an escalation of agricultural conflicts in host countries (Madsen & Williams 2012, see also page 25). Pink-footed Goose is on Annex II/2 of the EU Birds Directive and as such may be hunted under national legislation. However, Member States must ensure that hunting of any species does not jeopardise its conservation status.

Current situation in Scotland

Breeding Greylag Geese show a strong preference for feeding on improved grassland and arable fields while they nest in moorland and unimproved ground. A questionnaire survey of agricultural impacts completed by farmers in Orkney by the Scottish Agricultural College (Girvan 2009) estimated that over 11,000 acres of grassland and 1,200 acres of crops were damaged by geese, with a third of this area showing heavy impacts, including pulling up of young plants, removal of grass crop and extensive trampling.

Scaring activity on the Scottish islands is widespread, with the use of streamers, gas guns and human scaring being the most frequent. Lethal scaring is done under licence during the close season and birds are also shot during the open season for sport and crop protection, when Icelandic migrants swell the number in Orkney to around 80,000 birds. Farmers report that scaring activities are only partially effective in reducing agricultural damage as birds are moved onto neighbouring ground and become habituated to scaring activity over time.

Discussions started on sustainable management of goose populations in the 2010 Scottish Government Policy Review of goose management (Crabtree *et al.* 2011). This stated that '*...we consider that sustainable management of a goose population requires that*

each population has a lower bound determined by population ecology (e.g. Population Viability Analysis) and legal obligations, and an upper bound determined by damage and management costs. Stakeholder preferences will inform decisions on both the lower and upper bounds.' The Review categorised resident Greylag Goose populations (*i.e.* the British population) as Low Risk in terms of conservation status.

In Scotland, papers presented to the Goose Science Advisory Group (GSAG) in November 2011 and the National Goose Management Review Group (NGMRG) in January 2012, outlined scientific and management principles that should underpin an adaptive management approach to goose populations. These were:

- to know goose numbers and life statistics, especially mortality from shooting.
- to have a degree of control over the numbers of geese being shot each year.
- to be able to assess population data and adjust take each year.
- to have agreement and buy-in from local interests.

These principles were agreed by NGMRG and underpin the approach to the British Greylag Goose Pilot projects.

Aim of Adaptive Management Pilots

Local Adaptive Management Pilot projects have been established to test these approaches. The aim of these Pilot projects is to maintain the British Greylag Goose population in favourable conservation status, whilst reducing impacts on economic and recreational interests. To achieve this aim the following set of objectives have been established in consultation with local stakeholders:

- maintain a sustainable and stable British Greylag Goose population and range.
- keep agricultural conflicts to an acceptable level.
- allow for recreational use that does not jeopardise the British population.

Adaptive management processes (*e.g.* the AEWA Svalbard Pink-footed Goose Species Management Plan, Madsen & Williams 2012; the U.S. Department of the Interior Technical Guide to Adaptive Management, Williams *et al.* 2009) follow a series of standard steps that enable an iterative approach to management to be taken. This approach improves our understanding of how the goose population functions and allows management actions to be adjusted in the light of experience.

The Adaptive Management Pilots will run for three years in places where conflict is significant, where the British Greylag Goose population can be managed effectively, and where there is buy-in from local stakeholders. To date, two Pilots have been approved; one in Orkney and one in the Uists. A third application for the islands of Tiree and Coll is under consideration.

The key components of all the Pilots are that:

1. A clear local governance structure is established and used to agree and review objectives, communicate between local and national stakeholders, deliver and monitor the Adaptive Management Pilots.
2. Scaring is undertaken to prevent serious agricultural damage, combined with the use of lethal scaring to prevent serious agricultural damage and to manage the population within agreed bounds.
3. A programme of monitoring and evaluation is carried out which will include the collection of data on annual goose counts, goose productivity, bag returns, farmer surveys to gauge goose impacts on agricultural production and the effectiveness of the Pilots. Information on the potential biodiversity benefits arising from changes such as increased arable cropping activity will be sought.
4. There will be an annual review of data (including Population Viability Analysis (PVA) and stakeholder feedback) to assess progress towards targets, identify issues and how to address them and an annual report prepared to inform decisions about the future management of the Pilots.
5. The issues around the sale of carcasses will be investigated, and if possible trialled within the Pilots to ensure their sustainable use.

Greylag Goose (Dominic Heard)

Key mechanisms for delivering agreed Pilot projects

The governance framework that SNH is using to manage the Pilots was established in 2000. The Scottish Government is responsible for policy decisions, with advice from NGMRG. Local management is through Local Goose Management Groups which are chaired by Scottish Government with local stakeholders being well-represented.

Land managers are actively encouraged to employ non-lethal methods to scare geese from their crops to prevent serious crop damage. In addition, each Pilot will aim to shoot an agreed number of geese informed by PVA. The target population range for each Pilot relates not only to the number of geese present, but takes account of their density on arable and improved land (their preferred feeding areas).

In Orkney, where the British Greylag Geese are joined by migratory Icelandic Greylag Geese, the Pilot shooting effort takes place before the migratory geese return for the winter. In the Uists, there are no Icelandic Greylag Geese and the Pilot has supported shooting throughout the winter months. Lethal shooting is supported through SNH licences to scare geese from crops to prevent serious agricultural damage.

Each Pilot is undertaken through a series of agreements with key stakeholders to guide the actions taken and the methods used.

The sale of carcasses generated through the Pilots is being explored to encourage their sustainable use, and prevent a large number of goose carcases being disposed of as waste. Sale is currently prohibited through section 6 of the Wildlife and Countryside Act 1981 and only 'domestic use' is permitted. It is proposed that the sale of carcases will be closely controlled through licences issues by SNH. This controlled sale would allow only geese shot as part of the agreed Pilot project into the food chain. Licences will be for a maximum of one year only to allow monitoring and assessment of the approach.

A risk assessment has been undertaken and it has concluded that the conservation status of British Greylag Geese will not be harmed by a controlled sale within these Pilot projects. This conclusion is based on assessment of their population fecundity along with the controls over shooting and sale. The risk assessment concluded that this approach is an appropriate way forward given the significant damage currently caused by British Greylag Geese and the likely escalation of impact if population control is not embarked on now.

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Eileen Stuart and Morag Milne

Origin and movements of the Slamannan Plateau Taiga Bean Geese

In March 1986, seven colour ringed Bean Geese (in a flock of nine birds) were reported from the Beauly Firth, Inverness, Scotland. The colour-ringed birds had been released by the Swedish Sportsmens' Association with support from WWF-Sweden. Between 1974 and 1988, 324 Bean Goose goslings were released in central Sweden. The aim of the re-establishment programme was to repopulate former breeding areas in the southern part of the range in Scandinavia where Taiga Bean Geese had formerly bred but had thought to have become extinct.

Most of the released birds wintered in Scania (southern Sweden) but clearly a small number had crossed the North Sea to spend at least one winter in Scotland. In February 1987, three colour-ringed Bean Geese, amongst a flock of 114 birds, were reported from the Carron Valley Reservoir, near Falkirk, Scotland and, the following winter, in December 1987, six colour-ringed Bean Geese, amongst a flock of 56, were also seen there.

No colour-ringed birds from the Swedish release programme were subsequently reported from Britain. It therefore seems likely that the seven released Bean Geese seen on the Beauly Firth in 1985/86 and the six (possibly including some of the same individuals) seen at Carron Valley Reservoir in 1987/88 wintered in Scotland for just three winters only. The latter two sightings were in flocks of primarily un-ringed geese and hence those birds were presumably not from the re-established population.

In early autumn 2011, as part of a telemetry study to describe winter feeding areas, cannon-nets were set on the Slamannan Plateau, near Falkirk and 15 Bean Geese were caught on 12 October. This increased the number ringed in Britain and Ireland to a grand total of 20 birds. Four adult males were fitted with Global Positioning System (GPS) data logger units and collars and the remainder were fitted with neck collars only. Thirteen of the 15 geese fitted with collars (including three of the four logger birds) were then seen many times in the Slamannan Plateau wintering area. Two attempts (over several nights) to download data using the Bluetooth capability of the GPS data loggers did not capture any data and we suspect that the GPS units had failed.

On 20 March 2012, seven of the collared Bean Geese were seen near Akershus, Norway (60.08 N, 11.39 E) in a flock of 143 birds, thus identifying a staging area that the Slamannan flock used prior to moving to their breeding grounds. But the breeding origin of Scotland's only regular flock of Taiga Bean Geese remained a mystery.

Six more Bean Geese were caught on the Slamannan Plateau in the following autumn, including one that had been marked the year before. Three adult males and one first-winter male were fitted with GPS-Global System for Mobile communications (GSM) units attached to neck collars and two first winter birds were fitted with GPS-radio units also attached to neck collars. After capture, all six collared birds were seen many times during the winter. Two attempts to download data from the GPS-radio

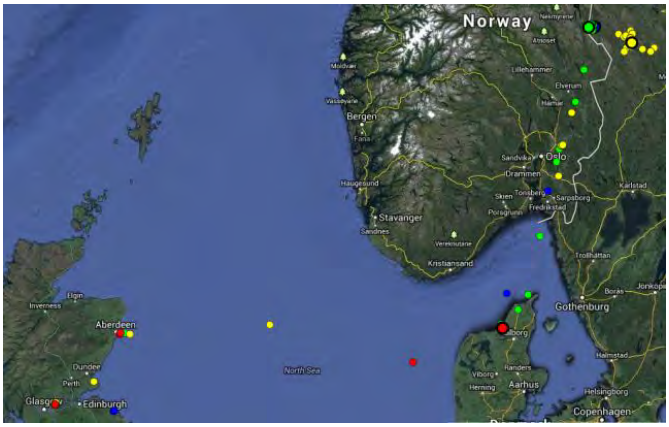

Figure 1. Spring 2013 migration route of four GSM tagged Bean Geese marked on the Slamannan Plateau, Scotland, in October 2012. The most recent locations (June 2013) were from west central Sweden.

units were successful and captured full within-winter location data since capture.

In late February 2013, the marked geese left the Slamannan Plateau and the four birds marked with GPS-GSM units were recorded in northwest Denmark, thus identifying another staging area of the Slamannan flock prior to moving to the breeding grounds. By mid-March 2013, all four tagged birds were recorded from Akershus, at exactly the same location the collared birds had been seen the year before. Counts of geese made in both northwest Denmark and in Akershus suggest that the Slamannan Bean Geese migrated together and were not mixing with other flocks of Bean Geese in nearby areas. By mid-April, three of the GPS-GSM tags were still working (the other was still GSM functional) and the geese had moved to west central Sweden (Figure 1). This area is mixed wetland/forest and seems potential breeding habitat and the flock of geese had now separated (individual locations being >50 km apart). This area was also that in which the Swedish Sportsmens' Association released their reared birds in the late 1970s and early 1980s.

However, by the end of May, these three tags stopped giving location data (although the GSM only tag continues to function into June). This may have been because the batteries in the tags had expired or it may have been because the birds moved to a new area out of range of the mobile phone signal which transmits the location data from the tags. At the time of writing (June 2013) it is not known where the Slamannan Bean Geese are spending the summer and possibly breeding. However, it is hoped that the tagged birds will continue to store location data during the summer months, to fill in the gaps, and transmit the data once they are again within range of a mobile phone mast, or that the two radio tagged geese will return to the Slamannan Plateau and we will be able to download the summer location data using a receiver.

Our attempts to unravel the breeding grounds of Scotland's wintering Bean Geese have met with partial success. We have very precise winter and spring staging area location data, but we await subsequent confirmation of the summer quarters of these rare geese and will report our results in a future *GooseNews*. Our thanks go to Scottish Natural Heritage, the Bean Goose Action Group, RSPB Scotland and Falke Renewable Energy for supporting the telemetry work and the observers both in Scotland and especially in northwest Europe who took the time to count the geese and read neck collars and report sightings to us.

Carl Mitchell, Larry Griffin, Angus Maciver and Brian Minshull

Latest conservation research on Greenland White-fronted Goose

The population of Greenland White-fronted Goose has declined from 35,600 in the late 1990s to just 22,400 in 2012, despite complete protection from hunting throughout the annual cycle. Greenland White-fronted Geese - as their name indicates - breed in west Greenland, stop over during autumn and spring in Iceland, and winter in Ireland and west UK. As a PhD student at the University of Exeter's Cornwall Campus, I've continued to concentrate part of my fieldwork specifically on stop over areas to examine population, and individual, level characteristics of this unique subspecies. Iceland is an extremely important place for Greenland Whitefronts, as they replenish depleted energy stores following the first part of their migration from the winter quarters. Accumulation of fuel stores in Iceland are essential for the onwards migration over the sea and Greenland ice cap. Daily observations of geese feeding in spring have revealed the urgency among Whitefronts as the narrow arctic timeline for breeding in Greenland looms. In 2012, we spent the entire stop over period in western Iceland at Hvanneyri, on the campus of the Agricultural University of Iceland and about one hour north of Reykjavik. The university grass swards (cultivated for livestock) support 2,000–3,000 Whitefronts each spring, the largest concentration of this goose in Iceland. Nearly 20 years ago, members of the Greenland White-fronted Goose Study began studying stop over ecology of Whitefronts across Iceland, but particularly at Hvanneyri. Their work has provided the foundation for the experiments and studies that have continued in recent years.

In spring 2013, an international team of researchers from Denmark, Ireland and the UK returned to Hvanneyri during 3 April until 10 May to document the entire spring stop over period. When I arrived on 3 April, there were about 400 Whitefronts in the area; due to the extended cold spring in western Europe, geese departed wintering areas a little later than the recent average, but still nearly three weeks earlier than 20 years ago. A network of bird watchers across Ireland and the UK provided daily reports of migration, with large flocks reported from North and South Uist and Tiree, often the last stop before birds depart for Iceland. By 10 April, the daily count at Hvanneyri totalled nearly 2,000 Whitefronts - our peak for the spring - with new arrivals daily, based on re-sightings of collared individuals. After the Whitefronts reached Hvanneyri, some remained to feed solely at the university fields, while others dispersed elsewhere in Iceland. Historically, the stop over period lasted approximately three weeks, although Whitefronts now stop over for about six weeks each spring, perhaps the result of warmer winters and earlier grass growth in Iceland.

While daily counts of geese on the university fields are paramount for our understanding of movement through Hvanneyri, there are a number of experiments that allow us to examine the 'nitty-gritty' of geese on stop over. As in 2012, we conducted clippings experiments in 2013 to simulate goose grazing on the two most common grasses (*Phelum pratense* and *Poa pratensis*), which involved measuring and clipping the nutritious middle shoot of the plant, at two-, four-, eight-, and sixteen-day intervals. Preliminary results suggest that grass growth was much slower in 2013 than the previous year, likely the result of a cooler (and snowier) spring. In 2012, temperatures were nearly 20°C by mid-April, resulting in record grass growth and seemingly more biomass than the birds could handle! We also collected grass and goose droppings for nutrient analyses in two study periods (early and late April) to compare with the late 1990s and 2012. It is important to understand how much grass the birds are obtaining, so we monitored peck rates and defecation intervals throughout the spring; these are important metrics for feeding intensity. We can then link feeding intensity to fat storage, through scoring of abdominal profiles (the shape of the 'rear-end' of the geese, which tells us how much fat stores they have accumulated) and weights of captured birds, which change dramatically throughout the spring as birds gain weight in preparation for migration to Greenland.

This year, Carl Mitchell and Alyn Walsh (National Parks and Wildlife Service of Ireland) led cannon-netting efforts, catching a total of 63 Whitefronts; this important injection of collared birds adds to the 130 Whitefronts collared on wintering areas this past year (see also page 23) and will aid in future estimates of survival. The team also re-sighted about 600 marked Whitefronts this spring, a few of which had not been seen for over a decade.

Greenland White-fronted Geese near Hvanneyri, Iceland (Alyn Walsh).

Included in the re-sightings were five special tagged birds; as part of my PhD research, we had deployed an additional 21 GPS/accelerometry devices this winter in Ireland and Scotland. The devices record one GPS fix per day; accelerometers log movement every six minutes in three dimensions, which tells us what the bird is doing at that instant. Grouping behaviours into important activity categories (*e.g.* feeding, flying, sleeping) then permits us to piece together exactly what the goose has been doing throughout the entire annual cycle. Data were downloaded remotely from *c.* 500 m via a radio link, avoiding the need to recapture and handle the birds. This spring, I was able to download data from two birds; frustratingly the others were too far out of range. Already, the tracks from these devices are giving us new insights, as they showed that both birds stopped at known wintering sites across Ireland and Scotland after departing from Wexford, Ireland (where they were tagged; Figure 2). They also showed that both birds migrated into slight crosswinds and averaged 20 hours flying time to southern Iceland.

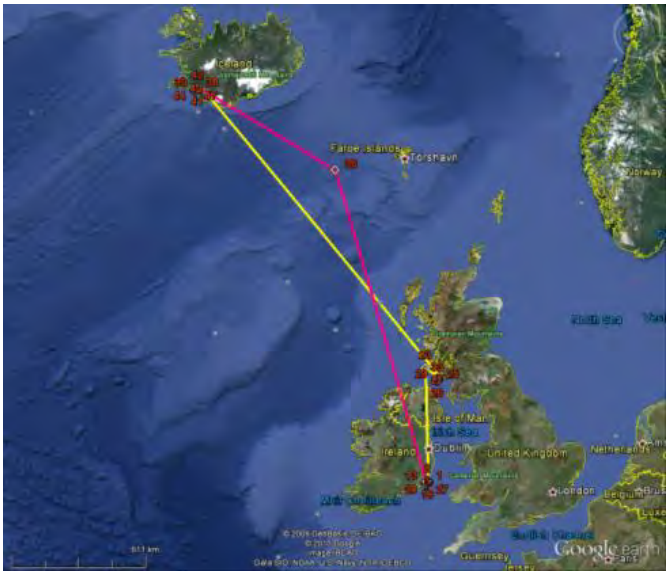

Figure 2. Tracks of two Greenland White-fronted Geese tagged in Wexford, Ireland in March 2013. Each point represents one day. Data were downloaded near Selfoss, Iceland in April 2013.

Finally, we continued work from 2012 filming family groups to identify the benefits of being associated with different group sizes on staging and wintering areas. One of the team members this year - Ed Burrell - is conducting his MSc at the University of Exeter and examining group benefits of spring stop-over Whitefronts. Uniquely, Greenland Whitefronts maintain parent-offspring relationships for up to sixteen years; in some circumstances, it seems being a member of the largest group means an individual goose has access to the best forage, compared to smaller groups that tend to lose out during aggressive encounters. However, the benefits of these associations for the selection of feeding areas and resulting competition require further examination. We'll incorporate film from Iceland and Ireland to quantify any potential benefits of these unique associations.

The work in Iceland this spring completes another field season. I'll return to the wintering sites in November for a final field season of the PhD, to attempt downloads from tagged birds. Data from both staging and wintering areas will aid in determining causes of the recent population decline of Greenland White-fronted Geese and allow us to make informed management decisions for continued conservation efforts.

Mitch Weegman

Uneven global warming triggers mismatch in Light-bellied Brent Goose migration

The different rates of climatic change across the northern hemisphere might affect the phenology of many migrating birds, and especially long distance migrants relying on local climatic cues to regulate the timing of migration. This relationship has recently been demonstrated for the East Atlantic population of Light-bellied Brent Goose which breeds in Svalbard (Clausen & Clausen 2013), and might be a contributory factor to the recent decline in breeding success among this small population. Recent analyses on the timing of spring arrival suggest that, while the onset of spring in Svalbard has advanced two weeks during the last 25 years, the arrival of spring has been unchanged in the temperate Danish spring stop-over areas. As a result, the spring departure of Light-bellied Brent Geese from Denmark has been unchanged during the same period, leading to a phenological delay upon arrival to the arctic breeding grounds (Figure 3).

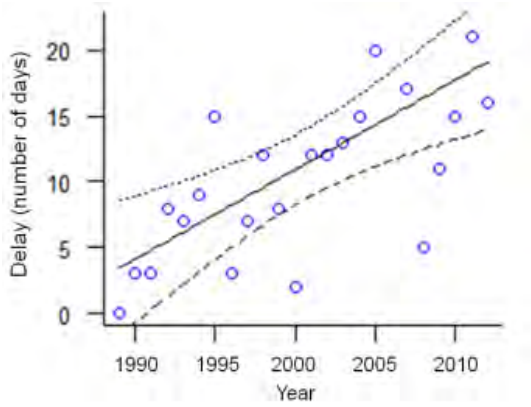

Figure 3. Development in phenological delay of East Atlantic Light-bellied Brent Geese during 1989–2012. Delay: number of days between Brent Goose spring migration (observed in Norway) and T200SV (the date when cumulative positive temperatures, a measure of growth initiation, reach 200 at Svalbard). The first year of data (1989) is used as a reference point, defining the number of days between departure and T200SV in this year as a delay of zero. Line indicates a significant linear regression (solid) with 95% confidence limits (dashed), and the high delay of 2006 (36 days) is omitted for clarity.

This indicates a global warming-induced phenological mismatch in Light-bellied Brent Geese, which might now arrive in Svalbard beyond the period of optimal breeding conditions. In support of this view, annual breeding success has been shown to be negatively correlated with the size of the mismatch in the preceding spring (Clausen & Clausen 2013).

The growing mismatch during the last 25 years has been paralleled by a simultaneous drop in breeding success (Figure 4), and this low productivity in combination with the return of cold winters in recent years has triggered a population decline. The wider implications of these findings may extend to other avian long-distance migrants, especially those flying non-stop between wintering and breeding areas as they are unable to synchronize with environmental factors during the course of migration. The continued accelerating impacts of climate change can only be expected to magnify in the coming decades, and if the challenges of a growing mismatch remain unanswered for Brent Geese and similar arctic breeders, this issue is potentially a major concern for conservation.

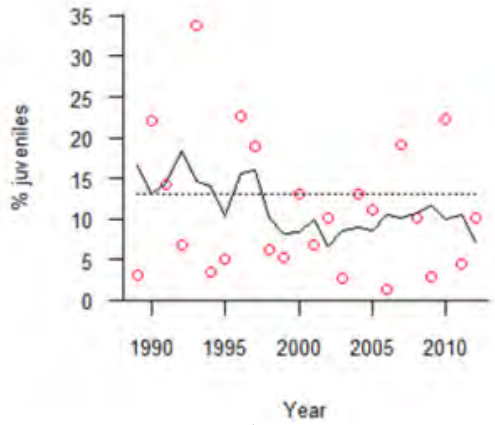

Figure 4. Annual breeding success (percentage of young in autumn flocks) of East Atlantic Light-bellied Brent Geese during 1989–2012. Lines indicate a three-year running average (solid) and average annual mortality in the population (dashed).

Reference

Clausen, K & P Clausen. 2013. Earlier Arctic springs cause phenological mismatch in long-distance migrants. *Oecologia*, Online First , doi: 10.1007/s00442-013-2681-0. (Due to be printed in the November or December 2013 issue of the journal).

(Figures reproduced with permission from *Oecologia*).

Kevin Clausen and Preben Clausen

Indicia: Reporting your Icelandic-breeding Goose Census counts

In *GooseNews* 11, WWT reported on the development of an online data entry and reporting system. Since then we've been working hard on various parts of this system. The colour-marked reporting forms have been tested and we're still working on the feedback we've received to improve it. So although it isn't finished yet - we'll let you know as soon as it's ready!

More recently, we've been developing the online forms and reports for the Icelandic-breeding Goose Census (IGC) in order for these to be available for the 2013/14 count season. Once logged in, observers work through three pages to enter the count information.

On the first page, observers enter the names of any additional observers involved in their count, before choosing the site and date (Figure 5). Then a set of tick-boxes allow observers to easily report the qualitative elements of the count such as:

- the count method – *e.g* a dawn roost count or a daytime count;
- the accuracy of the count – whether OK or Low due to *e.g.* disturbance or poor visibility; and
- the conditions during the count – such as ice coverage and the state of the tide.

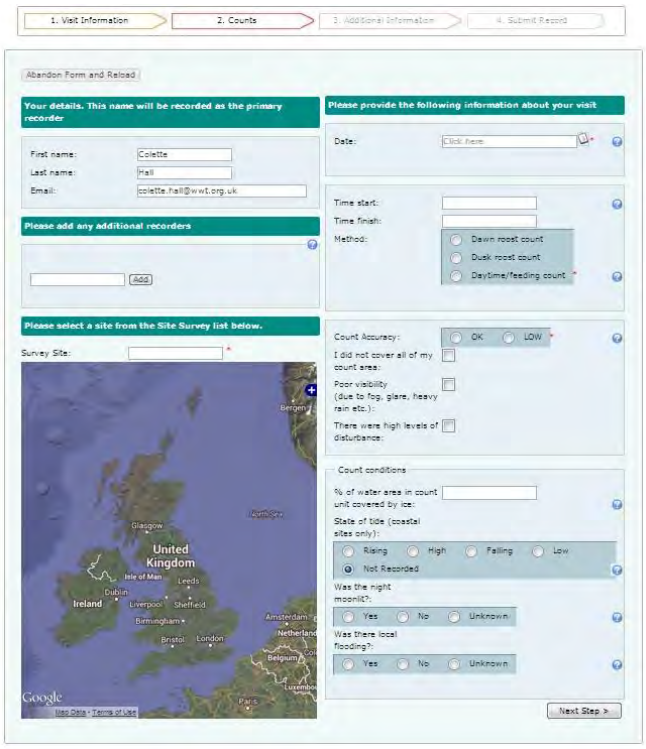

Figure 5. Information about the count visit is recorded using a map, look-up lists and tick-boxes.

The online system is map-based: observers will see their IGC sites on the form as they select them. We intend to improve this functionality in the future by allowing observers to report amendments to site boundaries on the website.

On the second page, a grid then allows observers to enter their counts for Pink-footed Geese and Greylag Geese (Figure 6). Observers can also add counts of additional goose and/or swan species (from a set list) that they have recorded during their count.

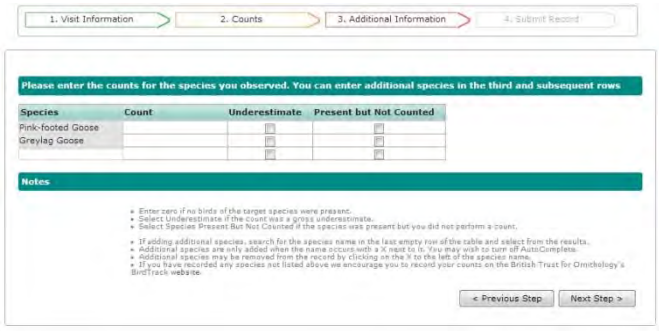

Figure 6. Grid for entering counts.

Finally, the last page prior to submitting the record allows observers to enter any general comments relating to the count. Once the record is submitted, it is shown for review. Records can be edited at this time; useful if any error has crept into the submission, or if an amendment or additional comment is needed. By using the 'My Observations' feature, observers can also review their data in maps and tables at a time of their choosing (Figure 7).

Site name	Survey Date	Species counted	Recorders	Spatial Reference	Completeness	Count Type	Actions
Three Brooks	01/01/2013	• Pink-footed Goose(NC)	• Colette Hall	ST57	LOW • Poor Visibility	Dawn roost count	edit
NewTestLocation	01/02/2013	• Pink-footed Goose(NC) • Canadian Light-bellied Brent Goose(22) • Brent goose(112) • Greylag Goose(NC)	• Robin Jones • Steve Roe • Colette Hall • Peter Cranswick	SO96	OK	Daytime/feeding count	edit
NewTestLocation	27/02/2013	• Pink-footed Goose(13) • Greylag Goose(NC)	• Robin Jones • Steve Roe • Colette Hall • Peter Cranswick	SO96	LOW • Poor Visibility	Dawn roost count	edit
NewTestLocation	07/09/2012	• Greylag Goose(34)	• Colette Hall	SO96	LOW • Incomplete Coverage	Dawn roost count	edit
WWT Llanelli	05/02/2013	• Pink-footed Goose(1) • Bean Goose(2) • Greylag Goose(2)	• Robin Jones • Colette Hall	SS5198	OK	Dawn roost count	edit
WWT Llanelli	26/02/2013	• Pink-footed goose(12) • Bewick's Swan(15) • Whooper swan(11) • Greylag Goose(5)	• Robin Jones • Colette Hall	SS5198	OK	Dawn roost count	edit

Figure 7. 'My Observations' grid of IGC records.

We'll be aiming for this season's counts (2013/14) to be recorded using the online system which will be sign-posted from our Species Monitoring Unit home page (http://monitoring.wwt.org.uk/). Forms will still be available on request.

We will contact counters once the system is up and running, as we think online recording will be easier and quicker to supply your counts to us. If you have any queries or would like further information, please contact us on monitoring@wwt.org.uk or contact Steve Roe (contact details on page 28). We'll continue to keep you informed as things develop.

Thanks very much to all those who have helped us plan, develop and test our system to date.

Steve Roe

Counter profile

Graham McElwaine: re-sightings coordinator for the Irish Brent Goose Research Group

How did you get involved, how long have you been doing it, and what is your role?
I guess I've always been interested in the use of volunteers in bird research, being one myself (I'm a retired civil engineer). It fascinates me how big a picture can be built up by the coordination of effort at the local scale. I suppose it brings out my building instincts!

On the organisational front, my first involvement came around the mid-1980s. Following on from arranging coverage for the Outer Ards (Co. Down) section of the Winter Shorebird Count for the British Trust for Ornithology (BTO) in the winter of 1984/85, I asked counters whether they would be prepared to carry on, so that we could build up enough data to present the five-year averages required for national/international levels of importance to be assessed. In 1986/87, there appeared to be sufficient volunteers who were also keen to contribute to assembling new baseline bird data in Co. Down. A glutton for punishment, I organised and collated five winters of monthly counts of wildfowl on the 100 or so significant lakes in the county and channelled the results into the Wetland Bird Survey (WeBS). A period of organising general survey work as BTO Representative for Co. Down also started around that time, as did the weird pursuit of cycling round the nether regions of Co. Donegal in the dark between midnight and 3 am censusing Corncrakes.

My first introduction to the anorak's world of birds carrying plastic leg-jewellery occurred on 2 February 1991, when I first read a leg-ring, yellow LHP, on a Whooper Swan. From that point on, I was hooked. This was virgin territory – the concept of studying birds as individuals! A new type of data, and only a few people were already ring-reading in Ireland, the main over-wintering area for the Icelandic population. This meant linking up with a different set of people, gradually forming a network of observers throughout Ireland and the Irish Whooper Swan Study Group (IWSSG) was born. The importance of channelling Irish re-sightings through a single person became apparent, as did the value of giving proper, detailed and personal feedback, which also included British and Icelandic re-sighting data from WWT, who organised the colour-ringing scheme. Folks started to find that the bird for which they had recently read the codes had, sometimes just a few days earlier or later, been recorded from England or Scotland, or had been caught and ringed in Iceland. Wow! That really got them into the loop, and got them out again with their telescopes!

With my wife in failing health in the early 2000s, the day trips down to Cork or Galway from my home in Co. Down to look for marked swans had to be greatly reduced. On my retirement in 2003, I was approached by the recently formed Irish Brent Goose Research group (IBGRG), who had started catching the East Canadian High Arctic (ECHA) breeding population of Light-bellied Brent Geese in 2001, asking whether I would set up and operate a re-sightings database for them. Not many birds ringed, another iconic Irish species, and I thought, why not, it can't require too much effort! Today, with nearly 4,000 geese caught, and a project which has attracted over 130,000 sightings from some 870 observers who have had to be serviced with feedback, I'm not so sure!

Where do you cover for ring-reading yourself, and what do you record?
My own ring reading goes through a cycle each year. The first Brent Goose arrivals at the northern mud-flats on Strangford Lough are usually at the end of August and numbers build up to a peak of over 30,000 in early October. At this stage of the season I try and achieve almost daily coverage, as some of these birds passing through will quickly move to small sites around Ireland that are poorly covered. I also try and get as many trips as possible up to Lough Foyle on the north coast, which is also a major stop over site.

Mid- to late-season, as well as regular checks on my local Co. Down sites, I try to visit those areas all round Ireland which appear to me, from returns already received, to be being less well covered, and aim to get at least monthly runs down the east coast from Carlingford Lough in Co. Louth to north Co. Dublin. I tend to avoid the major site of Dublin Bay/city as it has become increasingly well covered, given that nowadays the geese are using every public park and open space, including playing pitches and golf-courses, and in many cases the goose rings can be read without even the aid of binoculars!

The month of May each year brings an annual pilgrimage of a regular team of us to Iceland, to assist our Icelandic colleagues by ring reading along the west coast, north of their main study/catch sites, which are located near Reykjavik.

During all these sessions, as well as counting flocks I am trying to record associations/family sizes for marked birds. Other observers, particularly those who are studying a set area, are concentrating on the regular recording of the condition of the birds, but I find that, in attempting to check as many birds/flocks in a day as possible, the addition of this aspect would be too time consuming.

Have there been any particular changes in status or distribution in recent years?
Over the years of our project, the Brent Goose population has doubled in number from approximately 20,000 to 40,000 birds. This has led to greater numbers appearing at most sites throughout the range and, given that the favoured food *Zostera*

is of relatively finite extent, this has led to an expansion onto land for feeding, where the increased use of cereal fields and public spaces is leading to the prospect of future conflict.

Favourite moments since starting goose monitoring?
These are legion. The sight and sound of Brent Geese descending into the north end of Strangford Lough as they arrive after their long flight and the amazing vista of the massed flocks at the same location at peak numbers. I still get a buzz every time I manage to read a marked bird, but especially so when the weather and ring visibility conditions all come together for a big flock at a new or difficult site, and particularly in Iceland, where our time is obviously limited. Doing a successful 'twinkling' - the peculiar cannon-netters name for gradually manoeuvring birds into the safe catch zone – is also a high point.

What do you enjoy, or what motivates you most about your role?
I guess this is down to the Citizen Science thing; the fact I am part of a diverse team of professional researchers, academics, cannon-netters and volunteers, who are all contributing their different skills and time towards a common desire to increase the knowledge of 'our' geese. The get-togethers for catches or ring-reading expeditions, when far too much whiskey is consumed! Even the long, seemingly boring, periods spent waiting (longest so far is nearly a week) for birds to arrive in the right field/bit of mud-flat for a catch – it makes the end result so much sweeter, and can give me the chance to talk properly to people with whom I've only interacted via email before. I also enjoy trying to enthuse new contributors into becoming regulars. The fact that our ring-readers can go out on a date and time of their choice is attractive to a whole new series of people, who otherwise feel they don't want to be tied down to fixed survey dates.


Light-bellied Brent Geese at Strangford Lough (Richard Taylor-Jones)

Many thanks for all your help

The greatest strength of the GSMP lies in the tremendous volunteer input from you, the counters, ring-readers and other participants. We hope that you will continue to support the GSMP and, through it, the conservation of swans, geese and wetlands throughout the UK and beyond.

GooseNews is the newsletter of WWT's Goose & Swan Monitoring Programme. It is sent to participants each autumn and is available either as a printed copy or a pdf file. *GooseNews* is also available to download from the WWT website at http://monitoring.wwt.org.uk/our-work/uk-waterbirds/goose-swan-monitoring-programme/reports-newsletter/.

If you would prefer to receive *GooseNews* in an alternative format, please contact the Species Monitoring Unit at monitoring@wwt.org.uk.

Progress reports

Reporting the latest monitoring news

A more simplified approach to reporting the latest monitoring news is being introduced in this issue of *GooseNews*. A table presenting the most recent results from the Goose & Swan Monitoring Programme, including new population count totals and annual breeding success values (percentage young and mean brood size) where available, is given below. This is accompanied by shorter population updates. More detailed results are available on WWT's monitoring website at http://monitoring.wwt.org.uk/our-work/uk-waterbirds/goose-swan-monitoring-programme/species-accounts/.

Total counts and the breeding success (percentage young and mean brood size) of goose and swan populations recorded during various surveys in 2012/13; except the results for Greenland White-fronted Goose which are for 2011/12. Surveys were undertaken at an international or national scale, or at a few key sites; see individual population reports for further details.

Population	Total count[1]	Percentage young	Mean brood size
Northwest European Bewick's Swan	-	17.7%	1.7
Iceland Whooper Swan	-	16.0%	2.0
Taiga Bean Goose	309[2]	17.8%	2.0
Greenland/Iceland Pink-footed Goose	359,175[3]	21.1%	2.30
European White-fronted Goose	-	18.8%	2.2
Greenland White-fronted Goose	22,403[4]	8.8%	2.93
Iceland Greylag Goose	104,632[3]	21.7%	2.36
British Greylag Goose	-	27.9%	2.78
Greenland Barnacle Goose	80,670[5]	7.0%	1.80
Svalbard Barnacle Goose	31,000[6]	5.5%	1.6
Dark-bellied Brent Goose	-	3.1%	1.61
East Atlantic Light-bellied Brent Goose	-	7.6%	-
Canadian Light-bellied Brent Goose	41,465[7]	1.9%	2.61

[1] The official UK population estimates (*e.g.* for. calculation of national 1% thresholds) remain those of the Avian Population Estimates Panel (Musgrove, AJ, NJ Aebischer, MA Eaton, RD Hearn, SE Newson, DG Noble, M Parsons, K Risely & DA Stroud. 2013. Population estimates of birds in Great Britain and the United Kingdom. *British Birds* 106: 64–100). 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 from Slamannan Plateau and Yare Valley. From; Maciver, A & T Wilson. 2013. *Population and distribution of Bean Geese in the Slamannan area 2012/13*. Report to the Bean Goose Action Group and Ben Lewis (RSPB) *in litt.*

[3] Flyway total. From; Mitchell, C. 2013. *Status and distribution of Icelandic-breeding geese: results of the 2012 international census.* Wildfowl & Wetlands Trust Report, Slimbridge.

[4] Flyway total. From; Fox, AD, IS Francis & AJ Walsh. 2012. *Report of the 2011/12 international census of Greenland White-fronted Geese.* Greenland White-fronted Goose Study report.

[5] Flyway total. From; Mitchell, C, AJ Walsh, C Hall & D Tierney. 2013. *Greenland Barnacle Geese* Branta leucopsis *in Britain and Ireland: Results of the international census, spring 2013.* WWT/National Parks &Wildlife Service, Slimbridge.

[6] Flyway total. WWT data

[7] Flyway total. All-Ireland Light-bellied Brent Goose Census data provided by the Irish Brent Goose Research Group.

GSMP website

Much of the information on the Goose & Swan Monitoring Programme can be found on WWT's website at http://monitoring.wwt.org.uk/our-work/uk-waterbirds/goose-swan-monitoring-programme. This includes more detailed information on the results of surveys for all native goose and migratory swan populations. *GooseNews*, including past editions, is also available to download.

Breeding success of Bewick's Swans in 2012

You may already be aware that the Northwest European Bewick's Swan population has seen a 27% decline from the mid-1990s to 2005 with indications that numbers have continued to decline since then (Rees & Beekman 2010). Although the drivers for this decline remain unclear, the situation has not been helped by a succession of poor breeding seasons in recent years. However, the latest results of breeding surveys conducted across Northern Europe in the 2012/13 winter bring more positive news. In mid-December, hundreds of dedicated observers headed out to fields and wetlands across Europe to age over 12,000 Bewick's Swans in Lithuania, Poland, Germany, Denmark, the Netherlands, Belgium and Britain; a huge effort coordinated by Dutch ornithologists Jan Beekman and Wim Tijsen. A total of 14.0% young was found in the flocks surveyed, the highest proportion recorded since 2001 (when 14.5% was recorded). The mean brood size was 2.2 cygnets (in 325 families aged). Swans wintering in Britain had particularly good breeding success with 17.7% young recorded in 1,232 birds aged at four sites. The proportion of young wintering at and around WWT centres (16.9%) was considerably higher than the average recorded at these sites over the previous ten years (9.7%) and the highest recorded since 2000/01 (19.6%). This marks a continuation of improved breeding success recorded annually on the Ouse/Nene Washes and at WWT Slimbridge since the exceptionally poor 2007/08 breeding season when just 4.7% young was recorded. Conditions on the breeding grounds are important in determining the population's breeding success, in particular, weather conditions during the short Arctic breeding season. Relatively warm temperatures in the Pechora Delta (in the vicinity of an important breeding site for the species) in spring 2012 may have contributed to improved breeding success.

We would like to thank all of the observers who contributed to the coordinated age counts during the 2012/13 winter.

Reference

Rees, EC & JH Beekman. 2010. Northwest European Bewick's Swan: a population in decline. *British Birds* 103: 640–650.

Julia Newth

Breeding success of Icelandic Whooper Swans in 2012

Thanks to the efforts of many observers, a successful coordinated age assessment was carried out in January 2013, with 13,703 Whooper Swans aged at sites across Britain and Ireland, accounting for 50% of the total Icelandic population. Overall, a fairly typical 16.0% of the flocks surveyed were young birds and the mean brood size was 2.0 cygnets per family. The proportion of young for Whooper Swans wintering at and around WWT centres (12.8%) was slightly lower than the average recorded at these sites over the previous ten years (14.0%). There were mixed weather reports from the breeding grounds last spring; Icelandic colleagues reported that the spring and summer had been very dry and warm with almost no rain (S. Thorstensen pers. comm. 2012). During the annual ringing expedition, Sverrir Thorstensen observed many cygnets in Suður-Þingeyjarsýsla, an important breeding area in the north. Exceptionally bad weather in September saw heavy snow covering much of the higher ground and the valleys in the region. To what extent this bad weather may have affected the condition and survival of cygnets and contributed to regional variation in the proportion of cygnets recorded in flocks in the winter, remains unclear. A different picture emerged from Skagafjörður, north central Iceland, where fewer breeding pairs were noted, possibly as a result of a flash flood in the spring (O. Einarsson pers. comm. 2012).

We would like to thank all of the observers who contributed to the coordinated age counts during the 2012/13 winter. Over 25,000 migratory swans were aged, a tremendous effort yielding robust assessments of breeding success in 2012.

Julia Newth

The Icelandic-breeding Goose Census 2012

Autumn 2012 saw Pink-footed Goose numbers bounce back to the levels of those recorded in 2008 and 2009. In October 2012, a total of 353,840 Pink-feet was counted and, after adjusting for one site not counted, the population was estimated at 359,175 birds, a 37.9% increase on the revised census-based estimate in 2011. Census coverage was excellent, with very few sites not counted. Breeding success was just above average at 21.1%, with a mean brood size of 2.30 goslings per successful pair. The proportion of young in wing surveys of shot birds in Iceland was the highest on record at 45.5%. Whilst this clearly accounts for some of the increase in the number counted, it cannot fully explain the large increase in overall numbers, thus this confirms the earlier speculation that the autumn 2011, and probably autumn 2010, population estimates were partial undercounts. However, 2011 was an exceptionally poor breeding season, which must have also contributed to the decrease in the census total. The timing of the early autumn count, which normally provides the highest and, it is assumed, the most accurate estimate of population size, is clearly key to confidently assessing the status of the population. In some years, notably 2010 and 2011, at the time of the October census, a proportion of the Pink-footed Geese had not left Iceland. Counts from Iceland in early autumn are not accurate since the birds can remain in the remote interior and, in some years, it is possible that some birds remain in east Greenland, where no counting takes place. Autumn 2011 was exceptionally mild in Iceland, leading to Pinkfeet being able to remain there, and probably contributed to the under recording that year. While in some years peak counts at key arrival sites may be as early as late September, it seems sensible to continue to choose mid-October as the preferred census time. Weather conditions in Iceland in summer 2012 appear to have been favourable and

this no doubt contributed to the better than average breeding success. There was early and dramatic snowfall in early September, and this may have led to an early departure of geese from Iceland.

Whilst there have been large annual fluctuations in the counts in the last ten years, the overall trend has been one of steady increase (Figure 8) to *c.* 350,000 individuals. The wide fluctuations are more associated with the difficulties of accurate annual monitoring rather than dramatic changes in abundance.

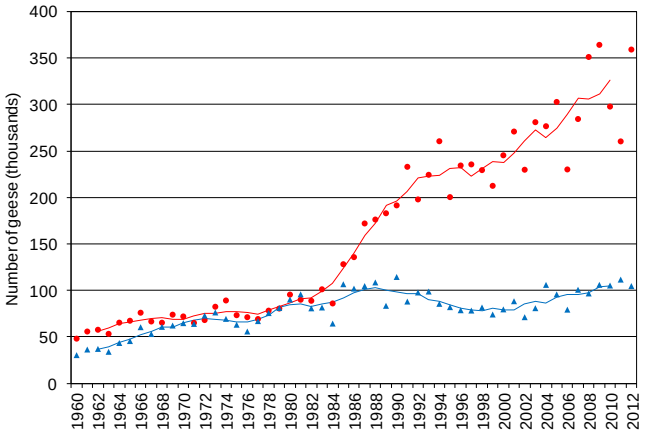

Figure 8. Population estimates for Pink-footed Goose (red circles) and Iceland Greylag Goose (blue triangles), 1960–2012. The five-year running means (*e.g.* mean for 2010 is from population estimates for 2008–2012) are shown as lines.

Some notably large counts were recorded in early autumn with 63,844 Pinkfeet recorded at Montrose Basin on 21 September and 77,683 in South West Lancashire at the time of the October census. The author aged over 1,000 Pinkfeet Geese at very close quarters on the Montrose Basin roost in mid-October and witnessed at first hand the spectacle of over 40,000 geese leaving the roost to their feeding grounds on surrounding stubble fields – a wildlife spectacle that is hard to beat!

Likewise, the timing of the census of Iceland Greylag Geese is also important for confidently assessing their abundance. In some years, the migration of Greylag Geese from Iceland to Scotland and other winter haunts is staggered; in other years there can be a mass exodus. The timing of the movement can be as early as late October and as late as late November. In autumn 2012, there appeared to have been an early departure from Iceland with 126,571 birds counted throughout their range in mid-November, and only an estimated 15,250 remained in Iceland at that time. In comparison, in mid-November 2011, *c.* 43,000 were counted in Iceland. The early departure may have been associated with extensive snowfall reported in Iceland in early September. A new update on the number of Greylag Geese summering in Orkney (21,367 counted in August 2012, although this had been reduced to *c.* 18,000 by the time of the census) meant that alterations to the Iceland population estimates for 2012 and the previous three years could be made. Adjusting for the presence of British Greylag Geese gave an Iceland population estimate in 2012 of 104,632 birds; a 12.7% decline on 2011.

Monitoring annual breeding success for this population is becoming more difficult because the main wintering areas (Orkney, Caithness and around the Moray Firth) hold ever larger numbers of British Greylag Geese and separating birds from each population is impossible in the field. It is possible that the only valid assessment of annual breeding success for this population is checking birds in Iceland in the autumn. However, 2,580 birds were aged in Orkney and Caithness and 21.7% young were found in flocks with a mean brood size of 2.36 young.

Orkney continues to hold the bulk of the population in winter. After deducting the number of British Greylag Geese, which are thought to be resident on the archipelgo, and taking account those shot under a pilot management programme (see page 5), an estimate of 57,519 Iceland birds were thought to be present in December. Caithness had unusually high counts in both November (16,324) and December (12,920). It is interesting to speculate whether the increase in shooting in Orkney as part of the pilot management programme displaced birds to the nearby Caithness feeding grounds. Thanks are expressed to all the IGC counters who contributed during the 2012/13 winter. Maintaining annual counts of these two populations relies on volunteer counters and for this WWT are extremely grateful.

Carl Mitchell

Taiga Bean Geese wintering in Britain in 2012/13

In Norfolk, the first wintering Bean Geese were recorded in the mid Yare Valley on 18 November, increasing to a peak of 76 birds in December. There has been a steady decline in the number of Bean Geese wintering there; 272 were recorded as recently as 2002/03. The flock contained two individuals marked with neck collars in Sweden by Thomas Heinicke and Adjan De Jong (see *GooseNews* 11, page 10). In Scotland, a peak count of 233 birds was made at Slamannan in November. A sample of the winter flock contained 17.8% young, with a mean brood size of 2.0 young per successful pair. Six Bean Geese were caught in mid-October and these were fitted with telemetry equipment enabling the birds' feeding and roosting habits to be studied in detail (see page 7). The geese spent the entire winter on the Slamannan Plateau in an area of approximately 30 km^2. In addition, the migration route and stop over sites in northwest Europe were identified for the first time.

The most important roosting area for the Slamannan flock has recently been purchased by the Forestry Commission (Scotland) and will safeguard this important site for the future. The Commission has bought a 90 ha area of land that lies between its 176 ha site at Fannyside Muir, near Cumbernauld.

Many thanks to Angus Maciver (Bean Goose Action Group) and Ben Lewis (RSPB) for additional information presented above.

Carl Mitchell

Latest monitoring of British Greylag Geese in Scotland 2012/13

Annual monitoring of all British Greylag Geese is not undertaken, but annual counts and breeding success estimates are conducted at three key areas within northwest and north Scotland where Greylag Geese are actively managed, namely the Uists (Outer Hebrides), Tiree (Inner Hebrides) and more recently in Orkney. On Tiree, the late summer (August) count totalled 2,210 birds, the lowest count since 1997. The November count totalled 2,409 birds and there were 2,871 in January 2013, suggesting a mid-winter movement of birds to the island. Breeding success was, once again, relatively high at 32.2%, with a mean brood size of 2.61 young per successful pair. On the Uists, 8,650 geese were counted in the early September census, although this was after *c.* 1,000 birds had been shot in August, and 7,500 were counted in late February. A sample of the population in August found 25.1% young and 3.08 young per successful pair. In Orkney, an archipelago-wide census was carried out in late August and found 21,367 Greylag Geese (Figure 9), the majority being on Mainland (10,625 birds). Breeding success was average at 24.9%, with a mean brood size of 2.95 young per successful pair. All three areas are subject to population regulation as part of SNH pilot management programmes (see page 5).

Thanks go to John Bowler (Tiree), Paul Boyer and Rebecca Cotton (both Uists) for the provision of additional data presented here.

Note; a full report on the Orkney survey can be found at http://monitoring.wwt.org.uk/our-work/uk-waterbirds/goose-swan-monitoring-programme/reports-newsletter/.

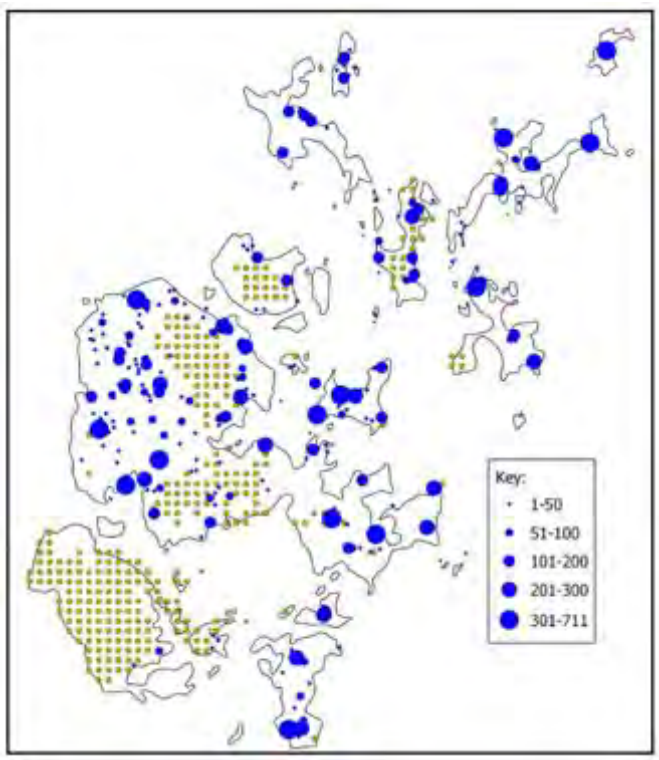

Figure 9. The distribution of Greylag Geese found during field surveys in Orkney in late August 2012. Blue dots are proportional to flock size. One km squares dominated by moorland are shaded in brown.

Carl Mitchell

Greenland White-fronted Geese in 2011/12

The internationally coordinated survey of Greenland White-fronted Geese undertaken on the wintering grounds in spring 2012, located a combined global total of 22,403 birds, the lowest recorded since spring 1986. This total was down by 13.0% (3,362 birds) on the last global population estimate of 25,765 in spring 2011. This fall in numbers erased the encouraging increase between spring 2010 and spring 2011, which was partly the result of an unusually good breeding season in summer 2010.

It is thought that the disappointing decline witnessed in spring 2012 was in part due to poor reproductive success in summer 2011 (for details see below). This seems to be part of the long term trend in relatively low output of young in the population which appears to be related to heavy snowfall that has occurred in west Greenland in springs since the mid-1990s. Although only some 16 mm of rain equivalent fell as snow in April/May at Kangerlussuaq in central west Greenland (close to the seasonal average of 18 mm), May temperatures were low (1.3°C) compared to the mean of 3.1°C for 1968–2011 inclusive. This means that temperatures persisted below freezing later than normal, with the result that the below ground storage organs of key forage plants would have been difficult for the geese to extract from the frozen substrate after arrival. Lower temperatures would have inhibited and delayed the growth of above ground green material slightly later in the spring as well. We know that breeding females rely on supplementing their body stores during the days following arrival in west Greenland, thus feeding immediately after arrival can be critical as a source of nutrients and energy to pre-laying females, and hence affect the ultimate breeding success of the population. Certainly the temperature and precipitation later in the summer of 2011 were not that different from average, so those females nesting successfully should have encountered benign conditions for brood rearing later on in the season.

However, following the poor breeding season in Greenland, the geese encountered very mild conditions on the staging areas in Iceland during autumn 2011. The weather had been incredibly mild in Iceland during the normal autumn migration period in late September and October, but remained especially so into late November, with the result that unprecedented numbers remained there well into the third week of the month, grazing on the grass that continued to grow late into the month. When they did ultimately depart, they did so into unfavourable winds, with falling temperatures and sudden snow in the last week of November finally forcing most of the remaining birds out, although a very few even remained into December. Thanks to Carl Mitchell and Guðmundur Guðmundsson of the Icelandic Institute for Natural History, we know there were 800 Greenland White-fronted Geese in the southern lowlands well into November. In the western staging areas, 800 were reported

to Arnor Sigfusson at Söðulholt and Dalsmynni on Snæfellsnes peninsula on 24 November, with 2,000 Greylags, which is very late for so many to remain behind. The unfavourable strong westerly winds caused many to be cast up along the west coast of Norway, with even up to five in Denmark and one adult bird on the island of Helgoland in the German Bight between 31 December and 9 January 2012. Hence, it appears that many geese were blown off course by these strong winds and even amongst those that did make it to Britain, many turned up along North Sea coasts in eastern Britain, well away from regular resorts, where several are known to have remained throughout the course of the winter. It seems highly likely that many of these vagrants did not make it back to their regular winter quarters and the disruption during the autumn migration very likely contributed to low population totals everywhere in winter 2011/12.

In the core wintering resorts, excellent count coverage was again achieved. In Ireland in spring 2012, there were 9,567 geese at Wexford (compared to 9,733 in spring 2011) and 2,675 (2,777 last year) from the rest of Ireland. Missing spring counts were substituted for five Irish regular wintering resorts, amounting to 1.2% of the Irish total. The 2011/12 totals comprised one and 29 birds reported in England in autumn and spring, respectively, 48 in Wales, remarkably low counts of 4,670 and 4,309 on Islay (compared with 6,891 and 6,911 last season) and 3,774 and 5,775 in the rest of Scotland (compared with 5,484 and 6,274 last season). Coverage in Britain was more or less complete, all resorts were counted at least once in the season, including the Small Isles (not covered in many recent years), where three were seen in February. Spring counts were missing from the specified count period from eight resorts, but all were substituted with counts undertaken very close to the defined international count dates, amounting to 5.9% of the British total.

As stated above, breeding success amongst geese wintering at British resorts was disappointingly down after the bumper production of young in summer 2010 (21.2% young). After the 2011 breeding season, the average percentage young was only 8.8% (n = 5,851 aged), and mean brood size was 2.93 (n = 192 broods, compared to 3.37 last season). This included 9.9% on Islay, (back below the average of 14.0% for 1962–2011 inclusive) where the mean brood size was 3.35 (n = 91 compared to 3.93 last year). The percentage of first-winter birds exceeded 10% only on South Uist, Tiree, at Moine Mhor Loch Ken and Stranraer. In Ireland, the percentage young amongst aged flocks in 2011/12 was also low, 7.6% (based on 5,273 aged individuals) compared to 14.7% last season. Mean brood size amongst the Irish flocks was 2.62 (n = 111) compared to 3.27 last season. There were 7.1% young amongst 4,342 aged at Wexford (less than half the 14.7% recorded last year), where the mean brood size was 2.86 (compared to 3.39 last season) based on 80 broods. Elsewhere in Ireland, reproductive success was higher, 9.9% (n = 931), but brood size lower at 2.00 (n = 31) compared to 2.81 last year. As usual, if we reckon on an annual adult survival of 85–88%, this means that many flocks simply did not receive enough young recruits of the year from summer 2011 to replace losses in the previous year, so the disappointing decline was not at all surprising.

As ever, we heartily thank the fantastic network of counters that continue to supply count, age ratios and re-sightings of individually marked birds. Thanks also go to Alyn Walsh for his tireless coordination of the count and reporting network in Ireland. Please note that the counts dates for the coming winter will be: Autumn international census dates: 14–18 December 2013; Spring international census dates: 15–19 March 2014; Other preferential dates: 16–20 November 2013; 11–15 January 2014; 8–12 February 2014; 1–5 March 2014, but remember no counts are ever turned away!

Tony Fox, Ian Francis and Alyn Walsh

Breeding success of European White-fronted Geese wintering in Britain in 2012/13

During January 2013, European White-fronted Geese were aged at two locations in England; WWT Slimbridge in Gloucestershire and RSPB's North Warren Nature Reserve in Norfolk. Overall, 360 geese were aged and a total of 68 goslings (18.8%) were present in the flock counts. At Slimbridge, 175 birds were aged with 35 goslings (20%) present (Figure 10), and at North Warren, a sample of 185 birds contained 33 goslings (17.9%). Brood size counts were carried out by the reserve wardens at Slimbridge with 34 goslings counted among 15 broods, giving a mean brood size of 2.2 goslings per successful pair.

However, despite the fairly typical breeding success among birds wintering in Britain, 2012 seems to have been a poor breeding year for this population overall (K. Koffijberg pers. comm.). Although data are still being collated from various wintering countries, the provisional estimate is *c.* 11% young based on flocks assessed in Austria, Switzerland, Germany, The Netherlands and Belgium.

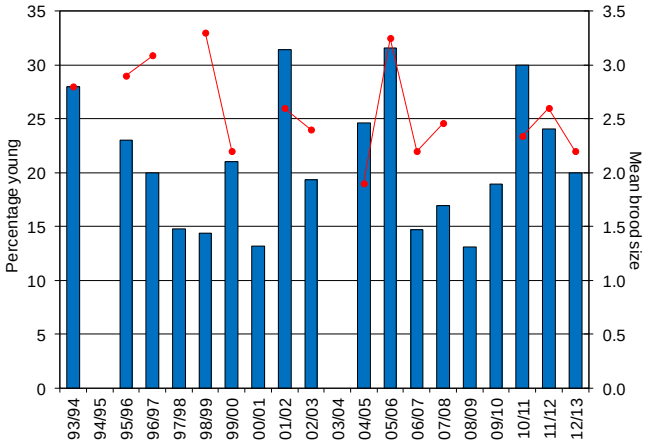

Figure 10. The mean percentage of young (blue columns) and mean brood size (red circles) of European White-fronted Geese at WWT Slimbridge, 1993/94–2012/13.

Kane Brides and Kees Koffijberg

Greenland Barnacle Goose Census in 2013: preliminary results

In March 2013, the most recent flyway-wide census of Greenland Barnacle Geese took place, including those parts of the winter range that need to be checked using a light aircraft. In Scotland, 226 sites were surveyed, including 190 islands by aerial census and in Ireland, a further 72 sites were checked. Barnacle Geese were found at 38 sites in Scotland and 31 in Ireland (Figure 11). In total 80,670 birds were counted, a 14.4% increase on the last complete census conducted in 2008 (70,501 counted). In Scotland, the total was 63,170, an increase of 8.4% since 2008. Islay was the most important site with 44,914 birds found there – an almost identical count to the one recorded there five years previously. In Ireland, 17,500 birds were counted, an increase of 43%.

Aerial photograph of Greenland Barnacle Geese (Alyn Walsh).

Compared to 2008, there were large increases in numbers in areas surrounding Islay; numbers on Tiree and Coll increased by 54% to 5,498; on North Uist (mainland), numbers increased by 128% to 3,523 and on Colonsay, numbers increased by 95% to 2,342. In addition, there were large increases in the number of geese recorded in north and west Ireland. It is interesting to speculate whether the recent increase in shooting and disturbance of Barnacle Geese on Islay as part of the pilot management programme has displaced birds to nearby winter grounds.

Breeding success in the population was assessed on Islay and Tiree. The Islay sample was much the larger and sampled flocks held 7.0% young, with a mean brood size of 1.8 young. On Tiree, 400 birds were aged and these contained 20 (5%) young, with a mean brood size of 1.05 young. For six out of the last eight years, breeding success has been below 10% young. However, despite the low annual productivity, the population has increased by 14.4% during the past five years.

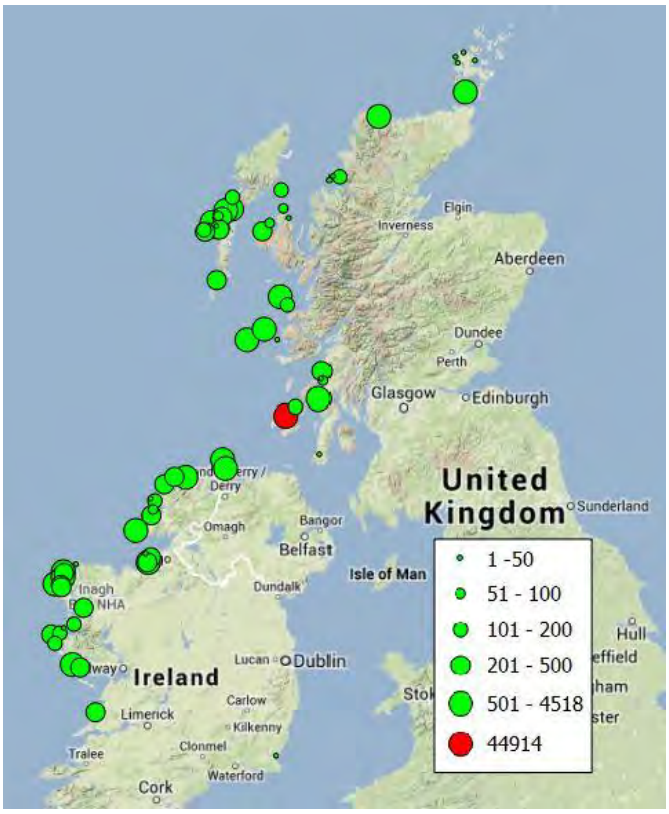

Figure 11. The distribution of Greenland Barnacle Geese recorded during the mid-March 2013 international census.

Thanks go to Malcolm Ogilvie and John Bowler for providing age counts and to Alyn Walsh for providing census count data from Ireland. Special thanks are also extended to all those who helped with ground counts during the census and to Colette Hall and David Tierney for assistance with the aerial surveys.

Note; a complete census report will be made available in due course at http://monitoring.wwt.org.uk/our-work/uk-waterbirds/goose-swan-monitoring-programme/reports-newsletter/.

Carl Mitchell

Svalbard Barnacle Goose monitoring in 2012/13

The adopted total for this population wintering on the Solway in 2012/13 was 31,000 geese (the mean of six counts that were within 10% of the maximum of 32,044 recorded, rounded up to the nearest 100), this represents a decrease of 2,900 birds on last winter's adopted total of 33,900 geese. Brood sizes were much smaller this winter at 1.6 goslings per family – there have only been two years with a lower average brood size since 1958 – with only a few large broods recorded (range 1–5 goslings; 172 families sampled). Overall 5.5% of flocks sampled were young, compared to 2.1 goslings per family and 12.8% young in flocks during last winter. Up to four different leucistic Barnacle Geese were recorded in 2012/13 including a family group of three that are probably the same birds that have used that area for the last three winters. The leucistic birds were mainly seen in the Bowness to Grune area or at Rockcliffe, Cumbria and the single bird was often seen in the Southerness to Colvend area, with two Ross's Geese seen briefly together on Rockcliffe Marsh.

Progress reports

Total population counts of Svalbard Barnacle Geese were already more than 23,000 by the first coordinated count on 3 October due to a rapid and sudden build up in the first few days of October after a late and slow start to the season; the first birds recorded were 91 at Caerlaverock on 23 September. The numbers then fluctuated as in previous years mainly in relation to count visibility conditions and goose dispersal. Due to this count variation, with possible inaccuracies and the chance of double-counting, an adopted count total for the population was derived by averaging those counts within 10% of the maximum recorded during the winter. In 2012/13 the counts of 31,621 on 24 October, 31,041 on 31 October, 30,208 on 14 December, 31,823 on 17 January, 28,895 on 24 April and 32,044 on 1 May (the maximum count recorded), fulfilled this criterion and were thus averaged to produce an adopted population total of 31,000 Barnacle Geese (rounded up to the nearest 100; compared to 33,900 in 2011/12).

The breeding success of Svalbard Barnacle Geese sampled on the Inner Solway from October 2012 to January 2013 ranged from 0.8% to 15.0% (6.1% to 23.5% in 2011/12) with a mean of 5.5% young from 21 flocks with 12,372 geese sampled (12.8%; n = 15 flocks; 6,643 geese sampled in 2011/12). Across the same area, the total number of broods sampled was 172, with a mean family size of 1.6 goslings, range 1–5 goslings (2.1 goslings, n = 124, range 1–5 goslings in 2011/12).

Thanks go to Mike Carrier and Bob Jones for conducting census counts in the Rockcliffe/Burgh Marsh area, Dave Blackledge for counts covering the Bowness to Grune route, Marian and Dave Rochester for covering the Borgue to Wigtown route, Paul Tarling for covering Crook of Baldoon, Peter Williams for covering Rascarrel to Sandyhills and Colin Bartholomew (who replaced Ben Mitchell as counter) for covering the Southwick area to Drumburn. Counts in the Caerlaverock area were also made by Mike Youdale and Brian Morrell.

Larry Griffin

Breeding success of Dark-bellied Brent Geese wintering in Britain in 2012/13

Age counts of Dark-bellied Brent Geese wintering in Britain were conducted at 13 estuaries or coastal locations where the species regularly winters. From October 2012 to April 2013, volunteer counters aged 72,447 birds at these locations. Overall, these flocks contained 3.1% young, 13.1% lower than the previous year and well below the previous ten-year average (10.5% for 2002/03–2011/12) (Figure 12). The mean brood size for pairs with young was 1.61 goslings in 2012/13, again lower than that recorded during the previous winter (2.26). This level of breeding success was to be expected following the relatively successful season in 2011 – rodent abundance within the breeding range was low to average, and the main predator of goslings, Arctic Fox, was abundant.

Although the recent average production of young remains below that generally thought necessary to maintain a stable population (*c.*15%), the abundance of Dark-bellied Brent Geese in Britain has been stable over the past decade (see WeBS reports). However, at a site level there have been some significant declines, with declines of >25% recorded at six designated Special Protection Areas, including a decline of 50% at the North Norfolk coast (for more information see http://blx1.bto.org/webs-reporting/). In contrast, increases of >25% have been recorded at five sites, most notably Chesil Beach and The Fleet SPA.

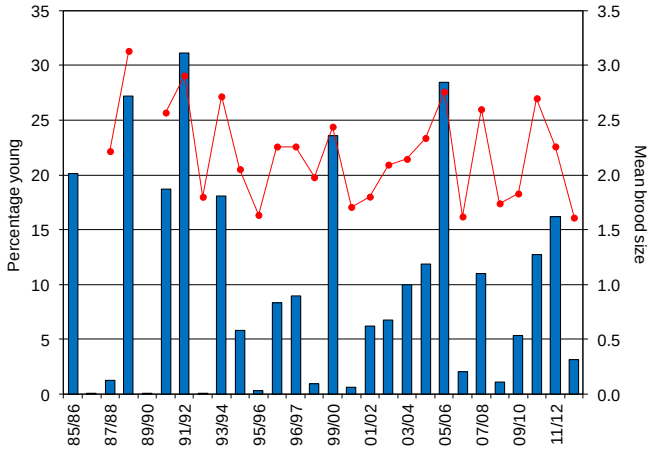

Figure 12. The percentage of young (blue columns) and mean brood size (red circles) of Dark-bellied Brent Geese in Britain, 1985/86 – 2012/13. No brood size data were available for 1985/86, 1986/87 or 1989/90.

Thanks go to all the counters who again supported this work by submitting an impressive number of age assessments of Dark-bellied Brent Geese in 2012/13. Your continued efforts are very much appreciated.

Kane Brides

Breeding success of East Atlantic Light-bellied Brent Geese in 2012

Two age assessments of the East Atlantic Light-bellied Brent Geese were carried out in October 2012 at Fenham Flats, Lindisfarne Northumberland. The largest sample of 130 birds aged contained ten juveniles within the flock (7.6%); no brood size data were collected (Figure 13). These counts were part of the annual flyway-based compilation of productivity. In Denmark, 1,369 birds were aged, with 10.4% juveniles and a mean brood size of 2.58 (n=36) recorded. Combining these data reveals a population productivity estimate of 10.0%. Later in November, higher proportions were found in a flock seen several times at Fenham Mill, Lindisfarne, with up to 46 goslings in a flock of 310 birds (14.8%) and even higher juvenile proportions in some smaller flocks. However, it is known that family groups tend to cluster together, and the large combined October 2012 samples from both sides of the North Sea will be used as the official value in the population monitoring scheme.

Internationally coordinated surveys suggested that the population has fallen below 6,000 birds in spring 2012 (see *GooseNews* 11, page 5). The October 2012 count gave an updated population estimate of 6,800 birds. Britain supports around half of the total population (almost all at Lindisfarne, though numbers fluctuate between years), with Denmark supporting the remainder. Low breeding success in this population is increasingly common and a cause for concern, but the reasons for this are not well understood (see the report on mismatching phenology, page 10).

Contributions to age-assesments were provided by Andrew Craggs, Derek Forshaw, Henrik Haaning Nielsen, Lydia Hind, Hans Henrik Larsen, Jens Peder Hounisen and Kevin Clausen.

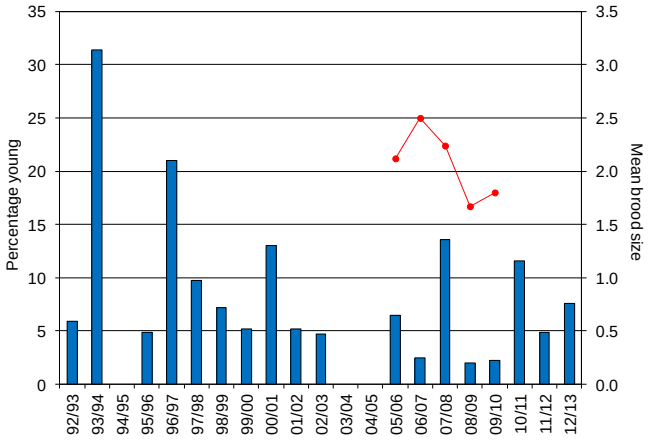

Figure 13. The proportion of young (blue columns) and mean brood size (red circles) in flocks of East Atlantic Light-bellied Brent Geese measured at Lindisfarne, 1992/93–2012/13. No data were collected in 1994/95, 2003/04 and 2004/05.

Kane Brides and Preben Clausen

Results from the Canadian Light-bellied Brent Goose Census

The East Canadian High Arctic population of Light-bellied Brent Goose has been rapidly increasing for the past 20 years (Figure 14). In October 2011, the 16th international census produced an estimated population size of 48,002, the highest to date. This followed a particularly successful breeding season, with age assessments indicating that there were 25.0% young amongst flocks (20,703 geese aged), and a mean brood size of 2.69 young per successful pair (Figure 15). The October 2012 census also produced a high total count of 41,465, the second highest census total, continuing the increasing trend. However, this total was 14% lower than the previous year and this is supported by age assessments that indicate the geese experienced a poor breeding season in 2012, with only 1.9% of the geese aged (n = 11,672) being young birds, although mean brood size (2.61 young per successful pair) was similar to 2011. There is relatively little information available on the conditions in the breeding grounds during 2012, but in 2011 rodent abundance was reported as high and most predators as abundant. There were clearly sufficient rodents to go around because bird breeding success was still good! The average breeding success during 2002/03–2011/12 was 12.9%, not much greater than that for Dark-bellied Brent Geese (10.5% during the same period), yet these two populations have very different trajectories.

Thanks are extended to Kendrew Colhoun (Irish Brent Goose Research Group) for providing this information, and the many counters that helped to collect these data.

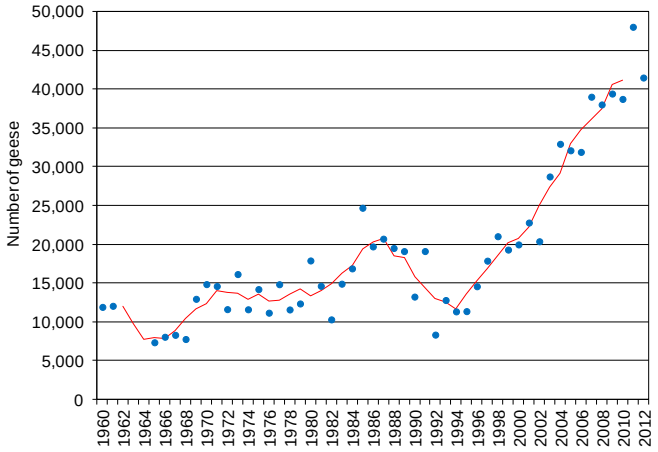

Figure 14. Estimate of population size of Canadian Light-bellied Brent Goose (blue circles), 1960–2012. The five year running mean (*e.g.* mean for 2010 is from estimates for 2008–2012) is shown as a red line.

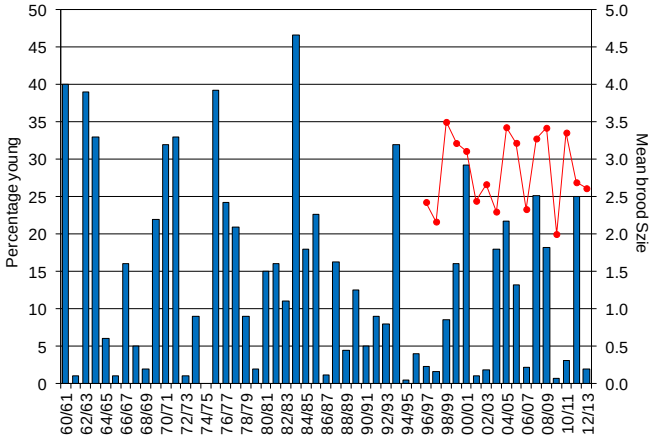

Figure 15. The proportion of young (blue columns) and mean brood size (red circles) of Canadian Light-bellied Brent Geese, 1960/61–2012/13.

Kane Brides

Progress reports

Recent success with capture and marking

Studies of Whooper Swans continued in Iceland during summer 2012. Sverrir Thorstensen and Ólafur Einarsson caught non-breeding flocks and family parties and, in total, 97 birds, a mixture of newly ringed and recaptured swans, were caught. Some 24 newly ringed cygnets were later seen on the wintering grounds in Britain and Ireland. Catches at WWT centres in February 2013 saw a total of 73 Whooper Swans (49 new/24 recaptures) at Martin Mere and 119 at Caerlaverock (47 new /72 recaptures). It was during these catches that a new ring colour was issued to any newly caught birds. Along with yellow and red rings, orange rings can now be seen on Whooper Swans marked by WWT and these can be reported via colourmarkedwildfowl@wwt.org.uk. Good numbers of Whooper Swans marked by WWT during the winter of 2012/13 were re-sighted. In total, 6,760 sightings, both at WWT centres and further afield were reported and it is encouraging to see more sightings coming from wintering sites in Ireland. Sightings also came from Denmark, Germany and The Netherlands.

A total of 30 Bewick's Swans were caught on the Russian breeding grounds and at two sites in southern Britain during the 2012/13 winter. On 15 January 2013, six swans were caught in the Simbridge swan pipe including two cygnets and one recapture. A second attempt on 8 February was more successful with 13 swans being caught, including five cygnets and two recaptures. One of these birds, named 'Bungles', had also been caught in January. All swans were fitted with leg-rings (or had existing rings checked), weighed and measured (to monitor body condition), X-rayed (to monitor levels of illegal shooting through the detection of embedded pellets) and had their blood tested for various health screening activities, including the detection of lead poisoning. Bewick's Swans were also caught at two other locations. Tony Martin ringed four birds (including three cygnets) in Cambridgeshire and Andrei Glotov ringed eight birds (all adults) on the Pechora Sea in arctic Russia.

Mike Dilger of the BBC's '*The One Show*', with Julia Newth (WWT), at the Slimbridge catch of Bewick's Swans (Graham Hann).

Thanks to volunteers Steve Heaven and Alison Bloor at WWT Slimbridge and Ailsa Hurst at WWT Martin Mere for their help in compiling sightings of colour-marked Whooper and Bewick's Swans.

Carl Mitchell and Alyn Walsh (National Parks and Wildlife Service of Ireland) led cannon-netting efforts in Iceland in April 2013, catching a total of 63 Greenland White-fronted Geese; these collared birds adding to the 130 Whitefronts collared on wintering areas during the winter (see page 8 and 23). The team also recorded around 600 colour-marked Whitefronts during the spring, several of which had not been seen in over a decade.

One of the most significant features of the 2012/13 winter was the early arrival of Canadian Light-bellied Brent Geese at Strangford Lough. The 150 geese counted on 29 August were eclipsed by the presence of 5,600 the next day, and numbers built rapidly through early September to peak a month earlier than normal. The bulk of cannon-netting activity was associated with Matt Silk's PhD project (with Exeter University) in Dublin – three catches of 27, 80 and 33 geese were made on amenity grasslands there. No birds were caught in Iceland, due to the birds' irregular behaviour. Many thanks to Kerry Mackie, Alan Lauder (BirdWatch Ireland) and Stuart Bearhop (University of Exeter) who cannon-netted the birds and thanks go to those who provided help with these catches.

Sightings of marked Light-bellied Brent Geese in the winter of 2012/13 (at time of writing) number 13,642 records of 1,819 individuals, received from 203 observers. However, there are still thousands of records, particularly from intensive ring-reading in Dublin, yet to be added to the database. Two recently ringed Light-bellied Brent Geese from the East Atlantic population were recorded from different ends of Ireland (Down and Kerry) during the winter. Ring-reading in Iceland by our Icelandic colleagues continued. Matt Silk has also been working there (mainly at Alftanes near Reykjavik) on his detailed study. University colleagues and a team from the Irish Brent Goose Research Group spends time each spring attempting to cover the more isolated sites north of Reykjavik to aid the study. Once all outstanding records have been added, the database will hold well over 130,000 observations from across the flyway since 2001; an incredibly impressive achievement!

During July/August 2012, Maarten Loonen (University of Groningen) and his team caught 325 Barnacle Geese (229 new/96 recaptures) at Ny Alesund, Svalbard. On the Solway Firth, at Rockcliffe Marsh in Cumbria, yellow NID a bird marked as an adult male in August 1986 in Svalbard was found dead, which made this bird at least 28 years old.

A partnership of the Broads Authority, Norfolk Wildlife Trust, National Trust and the BTO has been working on two complimentary projects in the Norfolk Broads (funded by the Broads Authority) and at the Nunnery Lakes in Thetford (funded by WREN) to understand more about the movements of Canada and Greylag Geese and their grazing of reedbeds. Moulting geese have been fitted with coded neck collars; in June/July 2012, 27 Greylag Geese were marked at Hickling Broad and eight Greylag Geese and 14 Canada Geese at the

Nunnery Lakes. Even though only a small number of geese were marked, quite a number of sightings have been received, with 117 sightings of Greylag Geese and 190 sightings of the Canada Geese by the end of 2012. The sightings have continued to come in during 2013. Interestingly, the birds marked at the Nunnery Lakes appear to be relatively sedentary, with most staying around Thetford, while those marked at Hickling Broad have ranged over a wider area with sightings as far away as Havergate on the Suffolk Coast (74 km from Hickling) and Cley on the North Norfolk Coast (42 km). The project aims to mark some more birds during summer 2013.

Thanks to Julia Newth, Graham McElwaine, Mitch Weegman, Tony Fox, Larry Griffin and Lucy Wright (BTO) for their contributions to this article.

Kane Brides

Update on recent catches of Greenland White-fronted Geese in Scotland

Winter 2012/13 saw three successful efforts to catch Greenland White-fronted Geese in Scotland. For many years it has been an aim to catch geese on Islay as agreed by all partners at the international flyway and action planning meeting held there in February 2009. Since then, the logistics of catching on the island have conspired against us, with the weather, circumstances or just bad luck, hampering our attempts. However, in December 2012 a decent looking arable field just to the west of Loch Gorm at Ballinaby, with a crop of rape, that the geese seemed to be keen on, was identified and cannon nets were quickly set. A net was located next to a small ditch that the birds were coming to for a lunchtime drink and sure enough at 12 minutes past noon on 12 December 2012, 31 Greenland Whitefronts were caught along with 14 Greylag Geese. This was beyond our limited expectations as we have caught Whitefronts at Loch Ken every year since 2008, and a hand-slapping good catch there was ten birds. It was great that Malcolm Ogilvie, an experienced hand at these things, was just down the road and only too happy for the chance to handle some Whitefronts again and avail us of some stories of old.

The Whitefronts were all adults except one, a sign of the times unfortunately. They were all marked with white leg rings and orange collars, with older codes running from 0HK–9HK, 5HP–9HP, 0HX–9HX, and 0HU–3HU plus 8HJ and 9HJ also. Two birds did not receive conventional orange collars and were instead fitted with GPS-GSM (telemetry) collars (Figure 16), although with care and patience the plastic leg rings on these two birds can be read. The telemetry collars were fitted to update our knowledge of the connection between the feeding and roosting sites (Figure 17) of the birds using traditional haunts on Islay, as part of a project funded by Scottish Natural Heritage, but also to try to understand how many of the birds returning to Greenland attempt to breed. The solar-powered collars can log GPS fixes at the rate of about 4–10 per day, depending on the weather, and can then relay the location data to the mobile phone mast network. If no communication with a phone mast is possible, then the tags simply store the location data until one becomes available. Thus, as this article is being written, the tags have just stopped uploading their current location data because they have left Iceland (in the first week of May) where there is good phone coverage and migrated to the west coast of Greenland where there is next to nothing. As it turned out, much like Ballinaby on Islay!

A few months later, and we were back on Islay again, this time on the RSPB Oa reserve where David Wood, the reserve manager, had tipped us off about a few sites that the geese were favouring. Cannon-nets were set for a few days and, sure enough, after some excruciatingly odd disturbance events and just plain bad luck, as is usual with these things, in the dying hours of the last day we were there, ten birds walked into the catching area and the net was fired. These birds were fitted with leg rings and collars in the series 4HU–9HU, V2L–4HL and 0HE and again, no young birds were present in the catch. Six of these birds were fitted with solar powered UHF-GPS collars which can collect considerably more GPS data, with fixes

Figure 16. 'Mobi-scoped' (mobile phone picture taken through a telescope) of a Greenland White-fronted Goose at Ballinaby, Islay fitted with a GSM collar – note dark colour of collar.

Figure 17. Example of data collected from the Greenland White-fronted Goose shown in Figure 16 showing connectivity between feeding and roosting sites throughout the winter. The bird was first recorded in the Ballinaby area by Loch Gorm and subsequently just north of Bridgend before returning to Ballinaby area prior to migration.

possible up to every half hour. The downside is that they do not communicate via the mobile phone network, but a 'radio-handshake' via a Yagi aerial must be made with these birds and the data are not available without this. The good thing is that this handshake is available every five minutes over a distance of 1–2 km and so the observer can stay well back from the birds and doesn't have to disturb them. In early April 2013, it was already possible to download a month's worth of feeding and roosting data from all of these tags, so that was a good start to the project. The migration and breeding location data will hopefully be available from these birds when they return to Islay in October/November 2013.

Of course all of this work on Islay and at Loch Ken would be very limited if there wasn't additional important sightings from ring readers; the rings and collars mean little without them. An intrepid band of volunteers have been collecting collar sightings from flocks across Scotland and elsewhere for decades for the Greenland White-fronted Goose Study and one of the conservation objectives and top priority actions cited within the AEWA Single Species Action Plan was to '*Develop a complementary Scottish marking programme* [to the Wexford one], *at locations which allow for sustained re-sighting effort*'.

On Islay, for instance, prior to the two catches, one of us checked many of the flocks over a couple of days, probably looking at 2,500 to 3,000 heads and found 15 neck collars, which was very rewarding and valuable. Indeed on many of the shorter turfs it was possible to check the legs for white rings too and a couple of birds were located that had lost their neck collars and thus hadn't been reported for a couple of years. The great thing is, even within the short period of time since marking started at Loch Ken in 2008, we are already seeing good evidence of emigration of birds from Dumfries to places such as Islay and Kintyre, as well as to Ireland. These sorts of observations feed in nicely to the modelling work being conducted as part of a PhD between WWT, Exeter University and Aarhus University, by Mitch Weegman (see page 8). The models can predict what might be happening, but the marked birds can provide invaluable ground-truthing.

With these extra 41 birds marked on Islay, plus those that were already there, a ring-reading trip to the island should prove a profitable couple of days since the proportion marked is getting close to 1% of the island population. Plus it's always good to stop off on the way out at Clachan and Rhunaorhaine or even Machrihanish to check the flocks there too as these can turn up some real gems. With marking effort increasing on Islay, if any geese do emigrate it is quite likely that some will turn up in the Kintyre flocks. The good thing is with all the rings that are read, you can rely on a rapid response from Tony Fox containing the catch details and previous sightings of the marked bird. Feedback makes ring reading such an addictive activity and makes the marking more worthwhile too; maximising the information from the collars is the best we can do for the geese carrying them and so not only is it good to spend time reading the collars (and please be careful with collars containing the letters K or X) but it is also good to take the time to try and see if the birds are paired to other collared birds or unringed birds or appear to be unpaired. Even geese that are unringed usually have a recognisable belly bar pattern. It is often useful to make a quick sketch or take a 'mobi-scope' picture head on and for the left and right flanks. Then over the period of half an hour, you can check back on a collared bird and see if it is still walking side by side with the same presumed mate. Also, it is good to look out for the alert larger males often at the edges of flocks with heads raised and a female by their side and then perhaps a group of poorly marked youngsters in tow. Breeding success data, or more likely the recording of zero young for a marked bird or marked pair, is real gold dust since that helps us get to grips with the problems these birds are having in producing young and our understanding of how often or not they bring broods back to Scotland. So, it is well worth spending a bit of time observing the marked birds if at all possible.

We would be very keen to hear from observers (through Tony Fox) if they spot any birds with the GPS collars on in winter 2013/14, since, if they do not return to Islay or stop off in a different part of Islay then we may struggle to find them. These collars will probably just look odd and dark due to the solar panels on them, but the geese should still have the white coded leg ring - so please let Tony know of their whereabouts even if the leg ring cannot be read.

Please send all sightings of marked Greenland White-fronted Geese to Tony Fox at: tfo@dmu.dk

Our thanks to David Wood, Malcolm Ogilvie, David Beaumont, Ian Brooke, Peter and Pia Roberts and Christine Urquhart for help with the catches. Special thanks also go to observers who report sightings of marked birds.

Larry Griffin and Carl Mitchell

First meeting of the AEWA Svalbard Pink-footed Goose International Working Group

The first meeting of the African-Eurasian Waterbird Agreement (AEWA) Svalbard Pink-footed Goose International Working Group (SPfG IWG) took place on the 23 April 2013 in Copenhagen, hosted by the Danish Nature Agency. The meeting was attended by national delegations from three of the four range states along the flyway of the Svalbard population of Pink-footed Goose: Norway, Denmark and Belgium, while a Dutch delegation was unable to attend. National delegations were composed of representatives from the respective government authorities, as well as invited national hunting, farming and conservation organisations and national experts. Observers from the Federation of Associations for Hunting & Conservation of the EU (FACE) and the Finish Nature Agency also attended.

The meeting was held to discuss and agree on the strategy and actions needed to implement the International Species Management Plan (ISMP) for the Svalbard population of Pink-footed Goose. The ISMP is the first European test case of an adaptive flyway management plan which sets out to manage a population potentially threatening sensitive ecosystems, on its breeding grounds in Svalbard, and causing conflicts with agricultural interests, along its migration route, whilst ensuring that the population maintains its favourable conservation status. The plan details a number of objectives aimed at collaboratively managing the population size of Svalbard Pink-footed Goose following the principles of adaptive management, thereby securing its living conditions and habitats along its flyway, whilst ensuring that hunting of the species, in Denmark and Norway, is sustainable.

The meeting began with brief updates from the range states about the population and its management in each country. This was followed by a presentation from Dr. Fred A. Johnson, of the U.S. Geological Survey, updating about the setting up of a modelling framework to support the Adaptive Harvest Management of Svalbard Pink-footed Goose. This was one of the main focuses for the meeting, as a key element of the ISMP is the sustainable harvest of this quarry species in order to maintain a stable population size, at around 60,000 individuals.

Dr. Fred Johnson and other experts from Aarhus University, Denmark, presented information concerning development of a process for a three-year, adaptive cycle of decision making for setting harvest quotas for Svalbard Pink-footed Goose. The process involves alternating between: (a) an optimization procedure, which identifies a harvest quota based on resource conditions and the weight of evidence on nine alternative models of population dynamics; and (b) an adaptation procedure, which compares model predictions of population size with observations from the monitoring program to update model weights, which reflect the level of confidence in each of the alternative models. The optimal harvest strategy provides a three-year quota for every potential combination of the number of young and adults in the autumn population and the number of temperature days (*i.e.* days above 0°C) in May in Svalbard as an indicator of the breeding conditions and offspring produced prior to the hunting season. Recent harvests have been slightly below what appear to be optimal to stabilise the population near 60,000 individuals.

The working group discussed the requirements for implementing a sustainable harvest strategy, based on a three-year cycle for regulating hunting and starting in 2013. As part of this first phase for implementing an Adaptive Harvest Management strategy, it was agreed that an annual assessment of population status, harvest levels in Denmark and Norway (the species is protected in The Netherlands and Belgium) as well as model evaluations are essential to avoid uncontrolled population responses and to gain more knowledge as quickly as possible on population processes and responses to management. The annual review process will flag any dramatic decline in the population, which might be caused by unforeseen circumstances, and trigger possible emergency management actions. Under such extraordinary circumstances Denmark and Norway agreed that they will collaborate to take immediate action to close a hunting season for a period of one year, to be successively reviewed as part of the annual assessment for the Adaptive Harvest Management of the population.

A presentation was given by Dr. Ingunn Tombre of the Norwegian Institute for Nature Research (NINA) on the latest developments, throughout the flyway, in habitat restoration, managing agricultural conflicts and the monitoring of arctic

Pink-footed Geese (Sean Gray)

tundra degradation. Recent work in Svalbard indicates that the extent of goose grubbing is increasing, calling for a more systematic monitoring plan.

The working group recognised that implementing the ISMP requires continued monitoring of the population as well as carrying out other actions to manage conflicts and ensure suitable habitats throughout the flyway. An ongoing programme, supported by The Svalbard Environmental Protection Fund, for monitoring the impact of goose grubbing on the vulnerable arctic tundra in Svalbard was seen as crucial and fully supported by the IWG. Belgium reiterated their continued commitment to grassland restoration projects making reference to the ISMP objectives. Both in Denmark and Norway projects are currently conducted between hunting organisations and academic institutions to optimise hunting and educate hunters to shoot geese with minimal crippling, whilst ensuring that geese are able to utilise local food resources. A new website for the AEWA SPfG IWG, provided by the UNEP/AEWA Secretariat, will be made available shortly to present progress on the work, including monitoring information and management actions.

The AEWA SPfG IWG is coordinated by Aarhus University under a Memorandum of Cooperation with the UNEP/AEWA Secretariat. For more information on the meeting, please visit http://www.unep-aewa.org/meetings/en/pfg/meeting1/pfg_ismp_1.htm.

The ISMP can be found here http://www.unep-aewa.org/publications/technical_series/ts48_smp_pfg.pdf.

Jesper Madsen

AEWA's membership grows to 71 Parties with Iceland joining the Agreement

The UNEP/AEWA Secretariat has announced that Iceland has become the 71st Party to the Agreement as of 1 June 2013. With 103,000 km², Iceland is the second largest island in Europe, and the 18th largest island in the world. The country is often described as a land of fire and ice. It is one of Earth's youngest land masses and it is part of the Mid-Atlantic Ridge, where the European and North American tectonic plates meet. Even today, the country is growing by about 5 cm per year, as it splits wider at the points where the two tectonic plates meet. Lakes and glaciers cover over 14% of the country and less than 50% are vegetated. Most of this vegetation consists of tundra.

Iceland is part of the East Atlantic Flyway and rich in birdlife and therefore a popular country for ornithologists and birdwatchers. In total, over 100 migratory waterbird species occur in Iceland. The accession of Iceland will help to protect the country's migratory waterbird species.

For further details visit http://www.unep-aewa.org/news/news_elements/2013/iceland_new_party.htm.

Three new Ramsar sites for geese in Iceland

In February 2012, the Icelandic government doubled its number of designated Ramsar sites by adding three new sites to the List of Wetlands of International Importance, all of which are of particular importance for their contributions to the conservation of migratory goose populations.

The first, Andakill Protected Habitat Area (Andakíll, Hvanneyri, 64°33'N 021°46'W) in west Iceland, covers 3,086 hectares and comprises lakes, alluvial floodplains, bogs, marshes and managed hayfields associated with two major rivers, the Hvítá and Andakilsá which flow into the Borgarfjörður estuary in western Iceland. Regular inundation of the tidal flats have created large areas of sedge meadow dominated by Lyngby's sedge *Carex lynbyei* which was formerly a very important source of hay as winter keep for domestic stock and which is still harvested on the site. This confirms the strong socio-economic value of these wetlands to traditional Icelandic agriculture which continues to the present day and is core part of the development of a Wetland Centre at the Agricultural University of Iceland at Hvanneyri. The University was established here in 1890 and is now the centre for agricultural education and research in Iceland, which forms the core of the new Ramsar site, together with lands belonging to local farms in private hands. These wetlands, associated bogs, the modern grass hayfields, lakes and tidal fjord provide vital sources of food and areas of rest and safety for staging Greenland White-fronted Geese that stay for up to six weeks in spring and autumn on migration between British and Irish wintering areas and their west Greenland breeding grounds. Over 10% of the entire global population has been counted within this one staging area, which regularly holds up to 2,000 geese every spring. However, these wetlands are also of great importance for staging and breeding waders in summer, and the intertidal areas provide extensive mud, sand and gravel bars which are also important feeding grounds for birds, for instance, supporting up to 1,500 staging Teal (5–10% of the estimated Icelandic population) in spring for instance. The area was the first in Iceland to be colonised by breeding Shelduck and remains the national stronghold for the species. White-tailed Eagle and a host of other species also breed, while the lake (Vatnshamravatn) is an especially important nesting site for divers, and several species of ducks, waders, terns, gulls and passerines. The most economically important ecosystem service provided by wetlands and rivers in the Borgarbyggð municipality is fishing of salmonids, including wild Atlantic Salmon *Salmo salar*. Almost one fifth of all wild salmon caught in Iceland is derived from the Hvítá river catchment, while the Andakílsá is also a popular fishing river for salmon, Arctic Char *Salvelinus alpinus* and Brown Trout *Salmo trutta*.

The second new site, Gudlaugstungur Nature Reserve (Friðland í Guðlaugstungum, 64°57'N 19°16'W) lies on the northwest corner of the Hofsjökull, the small ice mass that lies near to the centre of Iceland and which is the source of melt water to the better known Þjórsárver wetland, designated a Ramsar site in 1990. The new Gudlaugstungur Ramsar site comprises 40,160 hectares and is one of the least affected wetlands of central Iceland. The area is a vast wilderness of outwash rivers draining off the glacier that fill with life in summer, creating a huge

extent of sedge fens, palsa mires and wetlands, interspersed with drier heathland and species rich dwarf willow scrub, with an abundant moss and lichen flora. The entire wetland is criss-crossed by streams and rivers, which create a dynamic and sometimes unstable landscape and leave the area pock-marked with pools, ponds and abandoned river courses that add to the diversity. This matrix of habitats supports the largest known breeding colony of Pink-footed Goose in the world, estimated at 13,600 pairs in 2002 or over 25% of the national and 18–21% of the world population of this species.

The third and final site is the Snæfell and Eyjabakkar Area (Snæfells- og Eyjabakkasvæðið) (26,450 hectares, 64°43'N 15°32'W) protected for its outstanding importance as a key moulting area for the Iceland/Greenland breeding population of the Pink-footed Goose. The site embraces the outwash flood plain of the massive Jökulsá í Fljótsdal river that drains the Vatnajökull icecap. At its inception, the huge flat open valley bottom is largely bare substrate and flowing water as the discharges from the glacier make their way northwards in the summer. However, this landscape rapidly transforms and becomes the basis for the development of a rich wetland vegetation which has created a massive mosaic of streams, rivers, ponds, lakes, sedge fens, palsa mires and a range of other wetlands. Safe in this wilderness, very large numbers of Pink-footed Geese undergo their annual late summer flightless moult where they replace their flight feathers before their migration south to the winter quarters. This area is known to have been a moulting area for geese since 1387. Some 13,000 moulting birds were counted in 1991, although since 2004, annual totals have been between 2,000 and 5,000 (counted in 2012) moulting geese, although the site remains of importance for the population. Such an extensive area of wetlands also supports a wider range of nesting waterbirds as well, including Whooper Swan, Golden Plover and Dunlin.

All three areas are outstanding international importance for the goose populations that they support and make a very substantial contribution to site safeguard networks along their flyways.

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The Joint Nature Conservation Committee (JNCC) is the statutory adviser to Government on UK and international nature conservation, on behalf of the Northern Ireland Environment Agency, Natural Resources Wales, Natural England and Scottish Natural Heritage. Its work contributes to maintaining and enriching biological diversity, conserving geological features and sustaining natural systems.

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