WWT The Wildfowl & Wetlands Trust

GooseNews

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The Newsletter of WWT's Goose & Swan Monitoring Programme

Editorial

Regular readers of *GooseNews* will no doubt be familiar with the term integrated population monitoring – a phrase used regularly by those in the bird monitoring world to refer to a suite of surveys that complement each other by providing data on all of the core demographic parameters (abundance, productivity, movements and survival) needed in order to understand how population size is regulated.

One such use of these integrated data is Population Viability Analysis (PVA). PVA uses demographic data to model population trends and predict future trend scenarios. This approach has recently been taken for a suite of five goose populations of particular conservation interest in Scotland to inform Scottish Executive management policies. This work made extensive use of WWT's Goose & Swan Monitoring Programme (GSMP) datasets and is an excellent example of the value of this integrated approach. Whether you conduct counts, carry out age assessments, or search for marked birds, every contribution to these different GSMP datasets will have been of great value to these PVAs, and thus future goose management and conservation policy in Scotland. More is explained about this work on page 5, and an article on the remit of the Scottish Executive's National Goose Management Review Group (NGMRG) is in preparation for the next issue of *GooseNews*.

PVAs are also an effective way of highlighting gaps in monitoring protocols, and to this end the Scottish Executive's Goose Science Advisory Group, who provide advice to the NGMRG, is currently reviewing monitoring needs for Scottish goose populations. Whilst it remains important that such needs are identified and prioritised from a flyway perspective, enhancements at a national scale are also of great value and may provide further impetus for increased international collaboration.

The long-standing collaboration between WWT and the Icelandic Institute of Natural History is currently bearing fruit for two key goose projects. One is the implementation of aerial surveys of Greylag Geese that are co-ordinated with the Icelandic-breeding Goose Census (IGC). It is hoped to begin these aerial surveys in 2005, and this will provide urgently needed data on the number of Greylag Geese remaining in Iceland until the IGC count in November. Anecdotal evidence suggests this is increasing and in some years several thousand birds may be present. This will help to address current concerns regarding the monitoring of Iceland Greylag Geese (see *GooseNews* 3 page 10), and more on this important development will be reported in future issues of *GooseNews*.

For the resulting species conservation action to be truly effective, it is essential to have the commitment and participation of all interested parties – or 'stakeholders' – particularly the local communities in areas where species conservation action is being targeted. For this reason, the inclusion of education elements is essential, yet to date this has not received the level of priority it deserves among goose conservation projects.

Supergoose is the latest initiative from WWT's East Canadian High Arctic Light-bellied Brent Goose integrated conservation programme that aims to ensure that species conservation action is fully disseminated to local communities and wider audiences, and that these stakeholder groups are fully involved in education elements.

continued on page 2

Light-bellied Brent Geese (Jonhan Oli Hilmarsson)

Contents

The research element of *Supergoose* involves the tracking of geese as they migrate through their flyway (essential for the identification of critical sites), but collaboration with BBC Northern Ireland has provided essential promotion for the work, and ensured the conservation messages reach as wide an audience as possible, particularly within Ireland where the vast majority of these birds overwinter. More on this exciting project can be found on page 15.

Another development that will allow WWT to reach a wider audience is the expansion of the waterbird monitoring web pages on the WWT website. Over the next few months, an increasing amount of information on the Goose & Swan Monitoring Programme will be available, including information on GSMP surveys, latest results and other information on the status of each population, and a range of resources for GSMP fieldworkers. This development will allow us to organise and report upon surveys more efficiently, giving more time to develop other important elements of swan and goose conservation, such as those highlighted above. WWT is keen to ensure that these web pages are of greatest use and interest to the GSMP network, and so we would be pleased to hear from anyone with suggestions for ways in which these can be improved.

Richard Hearn

Survey dates for 2005/06

Icelandic-breeding Goose Census

Count forms for the 2005/06 IGC have been mailed to all counters or Local Organisers with this issue of *GooseNews*. If you have not received your forms, or would like to participate for the first time, please contact the Waterbird Monitoring Unit at WWT Slimbridge. The co-ordinated count dates for this year are:

8/9 October and 5/6 November

In addition, as previously announced, a three-year phase of co-ordinated December counts will begin in 2005/06. The co-ordinated date for this year is:

3/4 December

If you are unable to count on these dates, please let either your Local Organiser or the National Organiser know so that we may try to arrange for cover of your site by another counter.

Note also that all counters are encouraged to carry out a count during September (see page 8 of *GooseNews 2* for further details).

Please also remember that, if possible, all sites should be covered during both the October and November counts as, although some may only support one species, in some years early arrivals of Greylag Geese or late arrivals of Pink-footed Geese mean that the best month for counting them may not be the usual one (normally November for Greylag Geese and October for Pink-footed Geese).

Age Assessments

Age assessments will continue during 2005/06 as usual. The survey periods vary between species and are shown below.

Population	Period	Notes
Whooper Swan	Oct - Jan	
Bewick's Swan	Nov - Feb	
Icelandic Greylag Goose	Oct - mid Nov	care needed with age identification
UK 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	Oct - Dec	
Canada Goose	Jun - Jul	care needed with age identification of fledged birds

Colour-mark Reading

All sightings of colour-marked wildfowl, not just geese, can be sent either direct to the relevant project co-ordinator or to 'Colour-marked Wildfowl' at WWT Slimbridge, or by email to colourmarkedwildfowl@wwt.org.uk

Further details of other colour-marking projects can be found on the EURING colour-marking website: http://www.cr-birding.be

GSMP reporting & communication

It is now clear that the majority of the GSMP network readily use email and have reliable access to the internet. Therefore, in order to provide a more dynamic communication and reporting system, as well as reduce administrative time and costs, we are planning to make more extensive use of these means to feed back survey results, reports and other information.

Before doing so, we would like to consult the network to ensure we choose the most favoured means of doing this. The current intention is to move away from mailing paper copies of reports to survey participants with access to the internet. Instead, these reports will be made available on the WWT website as pdf files to download, and relevant network members would be informed of their availability by email. The WWT website will also be developed over the coming months (see below) so that summary information on the status of individual swan and goose populations can be viewed directly, without the need to download pdf files, along with other information (e.g. on forthcoming surveys) and resources of interest to the GSMP network. No change to the way in which network members receive *GooseNews* is currently planned, but many members already receive it as a pdf file emailed direct to them. Greater use of this option would reduce administrative costs for WWT, so if you would be willing to switch from a printed copy to a pdf version of *GooseNews*, please do let us know.

Improved levels of information provision are also envisaged, via email, on issues such as dates for forthcoming surveys. These will only be communicated to relevant sub-groups of the network, and we do not expect this to generate a large number of emails; the average active GSMP fieldworker can expect to receive in the region of ten emails per annum, which we hope is acceptable.

We have not, of course, forgotten that some members of the GSMP network do not use email or have access to the internet, or may wish to continue to receive printed copies of reports and newsletters. Paper copies of reports and *GooseNews*, as well as communication by letter, will therefore continue to be available to anyone requiring them.

We have already contacted many members of the GSMP network, and all active fieldworkers for whom we do not have an email address should have received a letter earlier in July asking whether they would like to receive information from WWT in this way, should they use email. If you do have an email address and would like to receive emails from WWT about GSMP issues, but did not receive this letter, or if you have any comments on these proposed changes to GSMP communication and reporting, please contact the Waterbird Monitoring Unit at WWT Slimbridge.

White-fronted Geese (Paul Marshall)

Count forms

As highlighted above, counters are making increasing use of electronic ways of communication and data storage. Whilst communication by email is a great help, the submission of counts by electronic means is not always a more efficient way of providing these data. We fully appreciate the convenience of doing this, but ask that for the time being counters continue to use count forms. We will, in due course, develop efficient electronic means of submitting data, but for now, using count forms ensures that we can maintain our current quality control systems. Please contact the Waterbird Monitoring Unit if you have any queries about the preferred means of submitting GSMP data.

Goose & Swan Monitoring on the web

To improve communication, and disseminate results more rapidly and widely, WWT is adding a series of pages about Goose & Swan Monitoring to its website. This will provide more details on the surveys and ready access to results, including copies of the reports to download. Other resources and useful information for counters will also be available, such as recording forms and instructions. A 'what's new' section will draw your attention to recently available information, such as count dates, as it becomes available.

The site will evolve over time, and we would be grateful for any feedback to help improve it for the counter network and others. Rest assured, for those without access to the web, we will continue to provide information, results and feedback via the normal channels.

Visit http://www.wwt.org.uk/research/monitoring/ to view the site.

The Northwest Scotland Greylag Goose Census 2006

The second co-ordinated census of Northwest Scotland Greylag Geese is currently being planned for August 2006. Plans are still at an early stage, and the precise methodology has yet to be finalised, but all counters who may be able to assist with fieldwork are asked to contact the Waterbird Monitoring Unit at WWT Slimbridge. An outline of the background and current plans for this census is provided below, and further details will be presented on the WWT website as they become available.

The NW Scotland (or Native) Greylag Goose population is the remnant of a population that was once much more widespread throughout the British Isles. In recent decades it has been confined to more remote parts of Scotland, with key areas of abundance on Coll and Tiree, in the Inner Hebrides, the Outer Hebrides, and in Sutherland. The only previous census of this population was conducted in 1997, although annual counts take place in key areas such as the Uists and Tiree. Anecdotal information suggests that since 1997 a considerable increase in abundance and, importantly, range has occurred, such that in some areas it is not possible to determine whether the Greylag Geese present are from the NW Scotland population or the Re-established population that also breeds in Britain and Ireland. Greylag Geese derived almost entirely from the NW Scottish range were re-introduced into areas formerly occupied, mainly by people with wildfowling interests. These re-established Greylag Geese are currently considered a discrete population, but have also increased in abundance and range, further complicating the separation of these two populations.

The 1997 census covered the area to the north and west of Glen Mor between Fort William and Inverness, with additional counts conducted in west Argyll as far south as the Kintyre Peninsula and on islands to the west. Due to the uncertainty over the current distribution of NW Scotland Greylag Geese, however, it is not possible to define the boundary between the two Greylag Goose populations. Therefore, the 2006 census will be extended to obtain a more complete understanding of the post-breeding distribution of Greylag Geese in Scotland. It may then be possible to make an estimate of the NW Scotland population, although this will depend on the degree of proximity between these two populations. It is possible that the 2006 census may cover an area as large as the whole of Scotland, but the feasibility of this and other census areas is currently being assessed.

The methodology employed may also need to be modified, depending on the size of the census area selected. The 1997 census used a basic 'look-see' methodology to survey all sites known to support Greylag Geese, as well as any others with suitable habitat. However, given the remoteness of much of this region, extending this approach to a larger census area is likely to be problematic. Thus, it is probable that an extended census will adopt a 'look-see' approach in known core areas, supplemented by targeted survey in other areas.

Greylag Goose (Paul Marshall)

As a part of the feasibility assessment for the census area and methodology, WWT wishes to consult with birdwatchers who may be able to assist with this survey, in order to gauge the level of likely support. We would also welcome opinion on the timing of the census. The 1997 census was carried out in the second half of August, but preliminary discussions with some counters suggest that in some areas this may be too early for effective survey, or even too late in others. Therefore, if you feel able to provide support for this census in any way, either as a potential counter in 2006, or by providing advice and expertise on the questions raised above, please contact the Waterbird Monitoring Unit at WWT Slimbridge.

Predicting goose population trends – what does the future hold?

During the second half of the 20th century, many goose populations in Eurasia and North America increased dramatically – for example the Svalbard-breeding Barnacle Goose population grew from 300 in the 1950s to over 27,000, while the North American population of Lesser Snow Goose increased to over six million. These population increases are the result in large part of changes in farming practices and restrictions on hunting. Over the winter, the UK is now home to around half a million migratory geese and their presence in such large numbers has led to conflicts of interest between conservationists and farmers, who may suffer significant losses as a result of goose grazing.

Within Scotland, where the majority of the migratory geese are present for at least part of the winter, the Scottish Executive, through Scottish Natural Heritage (SNH), is responsible for undertaking management of these populations. This requires a balancing act between the needs of farmers and obligations under EU directives to safeguard the populations. Current measures for managing the geese include the provision of reserve areas and payment schemes designed to alleviate losses incurred by farmers for high levels of goose grazing. In addition, scaring is used to encourage geese to spend time on reserve areas rather than farms.

One of the biggest challenges facing goose ecologists is attempting to predict if, and to what extent, these populations will change in size in the future. While attempts at such predictions are not new, the methods available are developing all the time. Perhaps the biggest influence on this area of research has been advances in computing, which has greatly enhanced our ability to both analyse population data and subsequently use these data to make predictions. Traditionally, predictive models have been used to estimate extinction risks for rare or threatened species, under the umbrella term Population Viability Analysis (PVA). However, the same techniques are equally suitable for larger, less threatened populations, and their use in such cases is increasingly common.

Five years ago WWT were asked by SNH to develop PVA for five goose populations (Svalbard Barnacle Goose, Greenland Barnacle Goose, Greenland White-fronted Goose, Pink-footed Goose and Iceland Greylag Goose) that winter in Scotland. These PVA were used to assist the management of these populations. Since the predictive accuracy of PVA declines as the duration of the predictions increases, it was decided that the analyses should be repeated on a five yearly basis, and the updated analyses have recently been completed. The models discussed here project the current populations for periods of 25 years. Each run of a PVA models produces a different population trend, since each years' survival and reproduction rates (which obviously determine the following year's population size) are picked at random from a range of values matching those observed in the field. Thus, it is highly unlikely that any two runs of a PVA model will produce the same sequence of population sizes. In addition to the random variation in the vital rates, other important features of a population's dynamics can also be modelled, such as density dependent regulation (i.e. suppressed survival or reproduction as a result of increasing competition for food, breeding sites, mates, etc, as the population grows in size). No individual run of a PVA model is expected to be a specific prediction of how the population will change, but by repeatedly running the model (e.g. 1000 times) common features of the population trajectories can be identified – for example, on average does the population appear more likely to grow or decline? By changing some of the parameters in the model (e.g. survival or reproduction) and comparing the results the possible impacts of altered circumstances, whether natural or man-induced, can be explored.

Figure 1 provides an example of the kind of output obtained using the PVA, in this case for the Scottish population of Greenland White-fronted Goose. The output represents a baseline prediction – that is, the range of possible population sizes expected if the conditions experienced during the period of data collection (1982-2002) are maintained over the next 25 years.

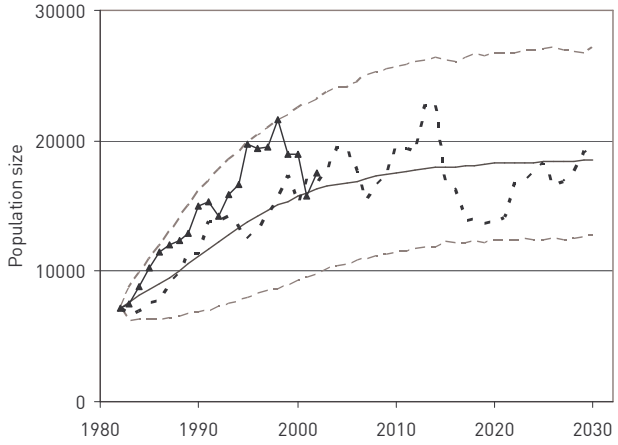


Figure 1. Predicted trajectory for the Scottish population of Greenland White-fronted Goose, starting from the 1982 population size. The solid line and triangles indicates the observed population size (1982-2002), the dotted line is an example of a single population projection, the smooth line is the median predicted population size and the dashed lines are the 95% confidence limits. The median and 95% limits were obtained from 5,000 simulations.

Similar baseline predictions were produced for each of the five goose populations, and in each case (with the exception of the Iceland Greylag Goose) the models suggest the populations will either remain near their current sizes or increase by modest amounts (see Table 1). The situation with the Icelandic-breeding Greylag population is harder to determine as there is evidence that our current estimates of the population size (and hence the demographic rates estimated using these data) are inaccurate. Consequently, three alternative models were developed for this population, each based on a different interpretation of the available data. The most optimistic of these models suggests that on average the population will grow by around 1.5% per year, while the most pessimistic suggests the population will fall by an average of 3.5% per year. Until

our understanding of this population improves, these models prompt the recommendation of a precautionary approach and therefore the pessimistic prediction was adopted. The apparent cause of this population decline is an unsustainable level of shooting. We need, however, a much better understanding of Greylag population dynamics before we can be confident of the actual situation, and this requires improvements in data collection. To this end, the Scottish Executive is currently exploring how best to monitor shooting bags in Scotland, and steps are in place to enhance WWT's population monitoring methods.

Amongst the remaining populations, the two Barnacle Geese currently appear to be at little risk of decline. The concentrations of these two populations within quite small areas over winter (all of the Svalbard population uses the Solway Firth, and approx. 60% of the Greenland population uses Islay) means, however, that on-going favourable management of these sites is critical to maintain their healthy status. Although Figure 1 suggests the Scottish Greenland White-fronted Goose population will average around 20,000, there is evidence that competition for breeding sites on Greenland with an expanding population of Canada Geese may cause population reduction. It appears that the more aggressive Canada Geese are able to displace White-fronts from breeding territories, and this has resulted in a decline in the proportion of breeding birds over the last ten years. Much work still needs to be done to confirm this theory, however, but if the number of Canada Geese breeding on Greenland continues to rise, White-front breeding may decline significantly. Monitoring on the breeding grounds over the next few seasons should improve our understanding of this situation, and hopefully lead to the development of mitigation measures. Finally, Pink-footed Goose and Iceland Greylag Goose populations may be affected by the development of hydro-power schemes in the Icelandic highlands. Several schemes have been proposed, some of which are already under construction. The extent to which these developments will remove (through flooding) and modify (through regulated river flow) areas of breeding and moulting habitat is hard to determine at present, although simulations suggest these schemes may lead to elevated risks of population decline.

This account provides only a very brief overview of the full analyses conducted. Any readers wishing to learn more should visit (http://www.snh.org.uk/pdfs/publications/commreport/Status_and_Population_Viability_Analyses_of_geese_in_Scotland_16605.pdf) where the full reports submitted to SNH can be viewed, along with a more detailed explanation of PVA methods.

Mark Trinder

Table 1. Summary of Scottish goose PVA baseline results. The median and 95% population sizes are derived from all the population sizes in the final year of the simulations. Population declines were estimated as the proportion of all simulations which fell below the thresholds (75%, 50% and 25% of the initial population size) during the 25 year projection interval.

		Projected population size after 25 years			Probability of decline below % of current population size within 25 years		
Goose population	Current population estimate	Median		95% limits (lower – upper)	75%	50%	25%
Svalbard Barnacle Goose	27,250	25,297		17,355 - 35,864	0.57	<0.01	0
Greenland Barnacle Goose	34,000	33,330		16,859 - 57,016	0.57	0.11	<0.01
Greenland White-fronted Goose	18,000	19,583		13,284 - 28,906	0.23	<0.01	0
Pink-footed Goose	210,000	197,219		68,715 - 385,601	0.86	0.45	0.05
Iceland Greylag Goose	73,000	Model 1	112,117	20,377 - 468,273	0.3	0.12	0.02
		Model 2	48,137	7,287 - 245,359	0.62	0.4	0.13
		Model 3	32,386	12,797 - 88,064	0.81	0.49	0.07

Breeding Success of Dark-bellied Brent Geese in 2004

Many thanks go out to the network of experienced volunteer observers who, for the 20th consecutive winter, undertook an annual assessment of the breeding performance of Dark-bellied Brent Geese. A total of 68,429 geese were aged at 19 different estuaries and coastal areas on the English east and south coasts, with the largest numbers at Langstone Harbour, Blackwater Estuary, The Wash, Crouch Estuary and Chichester Harbour.

The overall proportion of young birds was 11.9%, with the highest in January (13.9%) and the lowest in March (6.7%). Most flocks (36%) contained between 5-15% young, while the number of flocks holding 15-30% young formed a relatively high proportion of the overall total (30%). Of 1,339 broods recorded, the mean brood size was 2.30 young per successful pair.

The proportion of young and mean brood size recorded in the UK has increased each year since an extremely poor breeding season in 2000 (Figure 2). However, although the percentage young is the highest for five years, it still remains below the average mortality rate of 15%, and only once in the last ten years has it exceeded this rate.

Productivity is influenced by a range of factors including weather conditions and predator pressure on the Arctic breeding grounds. An interaction between rodent abundance and productivity has previously been recognised with a three year cycle of good, bad and variable success based on the cyclical nature of lemming abundance. It was expected that breeding success in 2004 would be variable following a predicted crash in the lemming population in the preceding year, but productivity was higher than expected. It appears that productivity figures, certainly for the last three years, no longer correlate with the proposed three year cycle of lemming abundance and, although predator-prey interactions undoubtedly influence productivity, lemming abundance cycles may no longer be operating in the same way.

The full report can be downloaded from WWT's website.

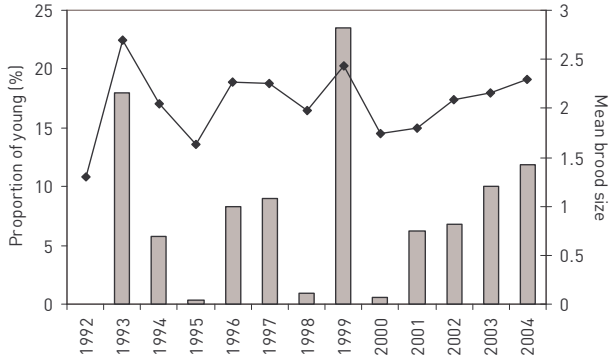


Figure 2. The proportion of young (bars) and mean brood size (dots) of Dark-bellied Brent Geese recorded in Britain, 1992-2004.

Jenny Worden

Breeding success of Greenland Barnacle Geese in 2004 – the highest for 14 years

An annual assessment of Greenland Barnacle Goose productivity in 2004 was carried out by SNH, RSPB and WWT at the three main wintering sites in Scotland: Islay, Tiree and South Walls, Orkney. A total of 38 flocks were assessed and 15,936 geese aged. The overall proportion of young birds was 16.1%, the highest recorded for 14 years. This figure has been exceeded only twice in the past 25 years: in 1990 with the exceptional figure of 23.7% young, and in 1989 with 19.8% young. Mean brood size, at 2.36 young per successful pair, was also the highest for 14 years.

Jenny Worden

Breeding success of European White-fronted Geese in 2004

In recent years, age assessments of European White-fronted Geese have only been routinely carried out at Slimbridge, Gloucestershire. However, in winter 2004/05, age count data was collected from four additional regions – Norfolk, Suffolk, Essex and Kent. The overall proportion of young was found to be 27.5% and mean brood size was 2.4 goslings per successful pair. Comparison with data collected at Slimbridge indicate that this is one of the highest percentage young seen in the last ten years, topped only by 31% in 2001.

Colette Hall

Table 2. Proportion of young and mean brood size of European White-fronted Geese in winter 2004/05.

Region	% young	Mean brood size
Gloucestershire	24.6	1.89
Norfolk	28.5	2.51
Suffolk	23.97	2.38
Essex	33.33	1
Kent	39.25	2.78
Overall	27.45	2.42

Recent successes with capture and marking

Here we provide a summary of some of the more notable catches of swans and geese by various ringers and ringing groups during winter 2004/05 and summer 2005…

Highland Ringing Group was once again able to capture Iceland Greylag Geese at Loch Eye, primarily due to the efforts of Bob Swann and Ivan Brockway. In total, 188 birds were caught and marked with orange neck collars during late October and early November, providing an extremely valuable top-up of the marked population. These birds generated many hundreds of sightings during the winter months, and particular thanks must go to Dick Hewitt, Bob Adam, Rob Minshull, Harry Bell in Fife and Neil Bielby for their continued enthusiasm in searching for marked birds. Other catches of Greylag Geese were made by Carl Mitchell (Strathspey) and Phil Bone (Yorkshire). At Sevenoaks, Dartford Ringing Group had an excellent catch of 227 Greylag Geese at the end of June 2005.

Wintering swans were again caught at a number of WWT Centres in January 2005. At Caerlaverock, a total of 185 Whooper Swans were caught of which 104 were retraps, and a further 48 were caught at Martin Mere, including 27 retraps. The number of Bewick's Swans caught was again low, with a small catch of 16 at Slimbridge.

The collaboration between staff at WWT Caerlaverock and members of the North Solway Ringing Group again proved fruitful, with two successful catches of Svalbard Barnacle Geese. The first, on 18 December, totalled 45 birds, and was followed by a catch of 47 on 30 March at RSPB Mersehead, including two individuals first ringed during the 1986 expedition to Svalbard.

Finally, the colour-marking of Light-bellied Brent Geese from the East Canadian High Arctic (ECHA) population was extremely successful. Graham McElwaine and Kendrew Colhoun report:

'The winter and spring of 2004/05 has been phenomenally successful, both in terms of the number of ECHA Light-bellied Brent Geese ringed, and in the number and scope of observations of ringed birds. In addition to catching geese for *Supergoose* (see page 15), successful catches were made on 11 dates over the winter, leading to 246 birds being cannon-netted and colour-ringed at Strangford Lough, Dundrum Inner Bay and Wexford North Slobs, of which only 19 were retraps. This was followed by an expedition to Iceland in May, which contributed towards a successful series of seven catches, in collaboration with the Icelandic Institute of Natural History, when a further 241 geese were marked (18 retraps). The latter included cannon-netting 90 geese on a golf course near Reykjavik, which is a record Brent Goose catch in Iceland!

The increased ringing success, which went into another gear in the 2003/04 season, began to bear fruit in 2004/05. The number of ringed birds read in the field jumped four-fold from 994 resightings of 240 individuals in 2003/04, to 3,923 observations of 487 individuals in 2004/05. Particularly pleasing has been the increased extent of coverage and number of observers from throughout Ireland (and west coast Britain!), a feature which, given the increased population of ringed birds, should bode well for the gathering of much new information in the coming season.

Since the initiation of this colour-marking programme in 2001, a total of 849 geese have been fitted with leg rings. Now, with many more marked birds out there, we would greatly welcome information on any ringed birds you observe. The data generated will yield valuable information on patterns of dispersal and population dynamics. Please send your records to Graham McElwaine, Resightings Co-ordinator, Irish Brent Goose Research Group, 100 Strangford Road, Downpatrick, Co. Down, Northern Ireland BT30 7JD. Tel. (028) 44612915, email graham.mcelwaine@virgin.net.'

The Icelandic-breeding Goose Census 2003

The 44th consecutive census of Iceland/Greenland Pink-footed Geese and Iceland Greylag Geese took place during autumn and early winter 2003. Two discrete counts were undertaken, one in October and another in November. Some sites were also counted during September. Coverage was good (although some important sites were not surveyed) and was again extended beyond Britain and Ireland, with a number of sites in Norway counted, and comprehensive coverage achieved in the Faeroe Islands.

Maxima of 274,594 Pink-footed Geese and 80,143 Greylag Geese were recorded in November, the largest count of Pink-footed Goose since monitoring began. These figures were adjusted to account for major sites that were not counted and for the number of Greylag Geese from the Re-established and

NW Scotland populations in the UK counted prior to this census, resulting in population estimates of 280,998 Pink-footed Geese and 81,131 Greylag Geese (Figure 3). Both estimates were higher than in 2002, representing increases of 22.3% for Pink-footed Goose and 11.0% for Greylag Goose. Counts in 2002 were, however, highly likely to have considerably underestimated true abundance for both species; comparing the 5-year running means for 2002 and 2003, the population estimate for Pink-footed Goose increased by 4.3%, and that for Greylag Goose decreased by 0.5%.

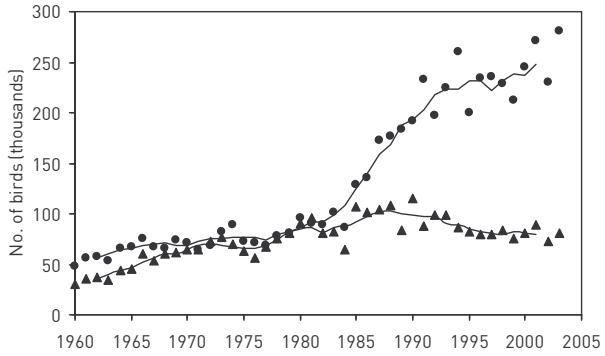


Figure 3. Population estimates of Pink-footed Goose (circles) and Iceland Greylag Goose (triangles), 1960 to 2003. The 5-year running means (e.g. mean for 2001 is from population estimates for 1999-2003) are shown as lines.

Reproductive success in 2003 was above the ten year mean for both species. Autumn flocks of Pink-footed Geese contained 19.0% young (mean proportion of young 1993-2002: 18.3%, 0.79 s.e.) and mean brood size was 2.2 goslings per successful pair (mean brood size 1993-2002: 2.3, 0.05 s.e.). Autumn flocks of Greylag Geese contained 20.5% young (mean 1993-2002: 17.7%, 1.19 s.e.) and mean brood size was 2.7 goslings per successful pair (mean 1993-2002: 2.6, 0.06 s.e.).

The arrival of Greylag Geese at their wintering grounds in 2003 was more typical than the late arrival in 2002. For the third time in five years, the peak count of Pink-footed Geese occurred in November, rather than the more usual peak in October. This suggests a gradual trend towards a later departure from Iceland. The consequences of this for the monitoring of this population need to be carefully considered in the coming years.

The proportion of the annual peak count of Greylag Geese present in wintering areas in October 2003 (49%) was more similar to the long-term average (1990-2002; 55%) than for recent years, when there has been a trend of decreasing proportions present at that time. Reports from many hunters in Iceland still suggested, however, that Greylag Geese remained long into the winter on the south coast, with hunting taking place as late as December. It is possible that as many as 20,000 were present at the time of the November count, with 12,000 in the south from Þykkvibær to Eyjafjöll. Early winter weather in Iceland has been very mild in recent years and, in addition, the acreage of barley grown has increased considerably in this time. Given these factors, it would seem surprising if Greylag Geese, and other geese, were not remaining in Iceland for longer. Therefore, as with Pink-footed Geese, it is important that these biological changes are reflected in methodological adjustments to the IGC that maintain the effectiveness of the census.

A later departure from Iceland, where hunting pressure is known to be high, may also result in more Greylag Geese being harvested each year. Given the current fine balance between increase and decline in this population, it is vital that such potential effects are measured. The monitoring of hunting bags in Iceland is however, currently unreliable because of a breakdown in the relationship between the hunting community and those deciding hunting policy in Iceland. Thus, any change in the hunting bag of Greylag Geese as a result of later migration is currently undetectable.

As a consequence of milder winter weather and improved agricultural habitats in northern parts of the wintering range, Iceland Greylag Geese appear to be redistributing northwards within the UK. Approximately three quarters of the population are now found in North Scotland during November, with around half in Orkney. This redistribution has important consequences for the protection of this population and its important sites, since most of the redistribution has been from protected sites to unprotected ones; for example, no Special Protection Areas exist in Orkney for Iceland Greylag Goose.

In order for protected area networks to adapt to these biological changes, it is essential that monitoring protocols do the same, so that new important areas can be identified. Questions regarding the abundance, distribution and productivity of Iceland Greylag Geese should be addressed at the earliest opportunity. Among the most important of these are: i) the need for comprehensive counts in Iceland and Norway co-ordinated with the IGC counts; ii) improvements in the understanding of delimitation between different Greylag Goose populations in the UK and Ireland; iii) a robust assessment of the methodological efficacy of the IGC; and iv) productivity estimates from Iceland. The development of these priorities is underway and their completion should ensure the continued effectiveness of the IGC in the future.

Helen Rowell & Richard Hearn

International Census of East Canadian High Arctic Light-bellied Brent Goose 2004/05

For the third consecutive year, a complete census of all major sites holding this population was conducted in October in Ireland and Iceland. Teams carried out thorough surveys from air (Iceland) and ground (Iceland and Ireland) around the weekend of 9 and 10 October 2004. Many thanks to the army of people who helped with the survey.

Counts of 26,250 (Strangford Lough), 1,603 (Lough Foyle), 1,700 (Castlemaine Hbr. & Tralee Bay) and 2,002 (western Iceland), together with a smaller number of counts from other sites (Table 3) gave an overall total of 33,042 – easily the highest count ever recorded for this population. Productivity was estimated at 21.8% reflecting a good year in the 2004 season.

Given the significance of the population estimate for deriving threshold levels, and for statutory designations, we plan to assess the accuracy of our counts through a variety of approaches in 2005/06, including repeat surveys, photography and partial aerial survey in Ireland. In addition to an appraisal of census methodologies, a thorough review of population development over the last 40 years is also underway.

Further information will be available from WWT's website.

Kendrew Colhoun, Kerry Mackie & Gudmundur A Gudmundsson

Table 3 Results of October international Light-bellied Brent Goose census in Ireland and Iceland.

Site	Count	% juvs
W Iceland	2,002	29%
Lough Foyle	1,603	20.7%
Larne Lough	15	54.5%
Belfast Lough	18	-
Strangford Lough	26,250	19.9%
Dundrum Bay	82	58.5%
Carlingford Lough	102	43.6%
Dundalk Bay	248	55.2%
Louth/Meath coast	27	54.5%
Dublin Bay	319	41.7%
N Wicklow Marshes	30	-
Dungarvan Hbr.	107	45.8%
Tramore Bay	153	-
Castlemaine Hbr.	500	-
Tralee Bay	1,200	31.4%
Inner Galway Bay	7	71.4%
Blacksod Bay	46	39.1%
Killala Bay	27	55.5%
Sligo Bays	300	30.6%
Outer Donegal Bay	6	83.3%
Total	33,042	21.8%

Greylag Goose monitoring on Tiree and Coll

Results of monitoring work including co-ordinated counts conducted by RSPB/SNH since 1991 on the native Greylag Goose population of the Inner Hebridean Islands of Tiree and Coll have revealed a continued long-term increase in numbers (Figure 4). A record total of 4,852 birds was recorded in February 2005. The population has more than doubled in size in the last ten years, with a ten-fold increase since 1985 (see Madders 1992).

Average breeding productivity in 1998-2003, measured as the percentage of young in August flocks and brood sizes in May-July, was 30% with a mean brood size of 3.6, which is comparable to figures for Greylag Geese on other Hebridean islands. A total of 1,002 Greylags have been caught and fitted with grey neck collars (adults) and yellow leg rings (goslings) on the two islands since 1998. Analyses of the re-sightings data of these birds showed that there is considerable interchange between the two islands but only limited movements elsewhere, with just seven recoveries to date of birds from other parts of Scotland. Recoveries have come from South Uist, Skye, Rum and coastal Wester Ross to the north, and from Mull and Islay to the south, indicating dispersal up and down the west coast of Scotland, despite low re-sighting probabilities in some areas. A large differencebetween annual productivity and estimated

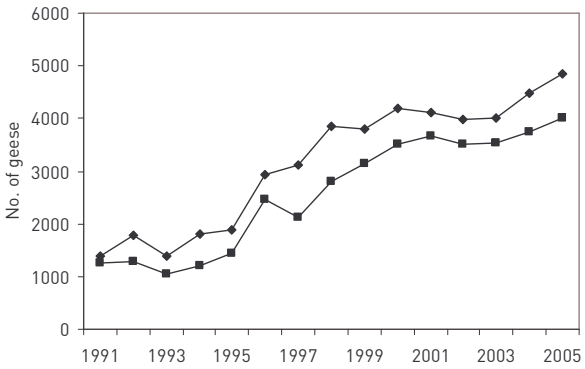


Figure 4. Counts of Greylag Geese on Tiree and Coll, 1991-2005. Data represent the highest count total for each year for Tiree (squares) and the two islands combined (diamonds) when both islands were counted within the same month.

mortality rates, coupled with a levelling-off of counts in 1998-2003, suggested that moderate numbers were emigrating from the islands. Greylag Geese fed primarily on silage fields and improved permanent pastures throughout the winter. Goslings remained with their parents until early April, when the adults moved to relatively remote, uncultivated land to breed. Winter home ranges of breeding adults and goslings were smaller than those of non-breeding adults and geese in their second winter,

suggesting that in competing with older more experienced birds, younger non-breeding birds had to move around more and, as a result, may be more likely to disperse and colonise new areas. Geese showed individual and specific preferences for restricted parts of potential feeding areas. For more details, see Bowler *et al* (2005).

References
Bowler, J., Mitchell, C. & Leitch, A.J. 2005. Greylag Geese on Tiree and Coll, Scotland: Status, habitat use and movements. *Waterbirds* 28: 61-70
Madders, M. 1992. Wintering and breeding Greylag Geese on Coll and Tiree. *Argyll Bird Report* 8: 13-18

John Bowler

Monitoring Greenland White-fronted Geese in Britain during 2003/04

The 2003/04 survey was the twenty-second annual census of Greenland White-fronted Geese carried out in Great Britain by the Greenland White-fronted Goose Study. Two complete counts of all known Greenland White-fronted Goose wintering haunts found totals of 17,449 birds in autumn 2003 and 16,387 in spring 2004. These comprised nine and eight birds in England, 116 and 112 in Wales, 11,272 and 9,653 on Islay and 6,053 and 6,614 in the rest of Scotland, in autumn and spring respectively. Counts were only missing from Muck where those from last year were substituted (comprising < 0.3% of the totals). Some counts from Orkney, Caithness, South Uist, Skye and Mull were substituted from adjacent months which amounted to 3.1% and 3.0% of the British totals in autumn and spring. Thirty-four geese were seen in January at the Loch Snizort site, confirming that this group persisted in winter 2003/04. We await count data from the rest of Ireland away from Wexford before we can provide the global population estimate for 2003/04. It seems unlikely however, that the spring 2004 total will exceed 27,000, based on previous Irish counts (unless there was a serious decline in Ireland in which case the global population would be even less), and suggests a further decline in numbers since the peak in spring 1999 (Figure 5).

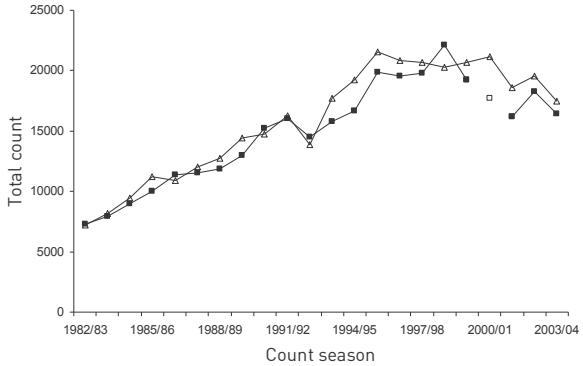


Figure 5. Counts of Greenland White-fronted Geese in Britain, 1982/83 - 2003/04, showing autumn (open triangles) and spring (filled squares) census results for each season. Note the missing value for spring 2001 (unfilled square) on account of the outbreak of Foot and Mouth Disease that year.

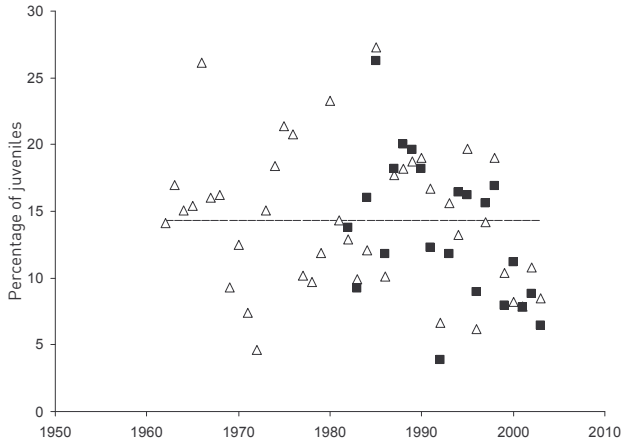


Figure 6. Percentages of first winter geese amongst samples of Greenland White-fronted Geese in Britain, 1962-2003, showing samples from Islay (open triangles) and the rest of Britain (filled squares) compared to the 1962-2003 Islay mean (horizontal dotted line). Note that the percentages have been well below the mean in each of the last five seasons.

Breeding success was again well below the average for the last 15 years, with 7.6% young (n = 7,987 aged) and a mean brood size of 3.1 young per successful pair (n = 152 broods). The majority of places failed to reach 6% young: there were 8.5% young on Islay (compared with 13.8% average during 1982-2002, and 10.8% last year) and 6.4% in the rest of Britain (compared with 13.5% average during 1982-2002 and 8.8% last year). The production of young in the five seasons since 1999 has been well below the running average for the years 1962-2003 (Figure 6). The continued low production of young (which fails to replace annual losses in the population) is doubtless the major reason for the decrease of 10.9% in the autumn count and a 10.3% decrease over the spring total in the previous year.

Tony Fox & Ian Francis

Breeding Success of Whooper and Bewick's Swans in 2004

Annual age assessments of Whooper and Bewick's Swans were conducted by a network of experienced observers during the 2004/05 winter. Totals of 6,916 Bewick's Swans were aged at sites in England, and 19,101 Whooper Swans in England, Scotland, Northern Ireland and the Republic of Ireland.

Breeding success was average for Whooper Swans wintering in Britain and Ireland with 16.9 % young recorded and an average brood size for successful pairs of 2.3 cygnets. There was marked regional variation in the percentage of young, with the highest proportion recorded in Northern Ireland and northwest England with a relatively low proportion of young recorded in southwest Scotland and east-central England (see Table 4).

Previous surveys have similarly found relatively high proportions of juvenile Whooper Swans in Scotland, Northern Ireland and the Republic of Ireland, compared with other parts of the wintering range, suggesting that families select sites closest to their Icelandic breeding grounds. There is a tendency for Whooper Swans ringed in western Iceland to winter in Ireland, and the high proportion of young seen in Ireland suggests that swans in the western part of the breeding range had a successful breeding season in 2004.

Breeding success was below average for Bewick's Swans, although higher than in the exceptionally poor 1992 and 1997 breeding seasons. A particularly low proportion of young was found in east-central England (8.8 % on the Ouse Washes). The Ouse Washes is the most important site for the species in mid winter, so the juveniles recorded there represent a large proportion of Bewick's Swans wintering not only in the UK but in the whole of the Northwest European flyway.

There was some regional variation in the proportion of Bewick's Swans recorded in different parts of England, with the highest found in southwest England (at WWT Slimbridge). The breeding success of swans that return to winter at Slimbridge may perhaps be partly attributable to the regular supplies of grain received by the birds, and the relative protection from disturbance at the site, although conditions on the breeding grounds are also likely to be important. Nevertheless, the proportion of young was below average for the site over the last five years, which concurs with the relatively low proportion of cygnets recorded on the Ouse Washes, and also in the Netherlands. Britain is the second most important wintering area for Bewick's Swans after the Netherlands and thus low percentage young recorded in both countries indicates poor breeding success for the Northwest European population as a whole in 2004.

More information is available from WWT's website.

Julia Newth & Eileen Rees

Table 4.The proportion of young and mean brood size of Whooper Swan and Bewick's Swan flocks during winter 2004/05.

	Whooper Swan		Bewick's Swan	
Region	% young	Mean brood size	% young	Mean brood size
Northwest England	19.7	2.5	13.1	2.2
East-central England	11.2	1.9	8.8	1.8
Southwest Scotland	10.7	2.8	15.0	2.1
North and central Scotland	17.9	2.6		
Northern Ireland	21.4	2.1		
Republic of Ireland	18.2	2.1		
Total	16.9	2.3	12.3	2.0

Pink-footed Geese on the Solway Firth 2004/05

Here, Frank Mawby, long-standing Local Organiser of the IGC on the Solway Firth, highlights recent changes in the use of this area by Pink-footed Geese, and raises some important considerations about how surveys, including the IGC, need to evolve as goose distribution changes so that we continue to generate good population estimates…

The Solway Firth co-ordinated IGC counts show that the number of Pink-footed Geese using the estuary to roost in autumn 2004 was low in October (1,482) but high in November (5,062). Typically, the peak count occurs in October, with only one other exception (1994) in the past 18 years. The December count was around average at 2,986. During the autumn the majority of Pinkfeet feed on the Scottish side of the estuary, or along the River Esk towards Longtown.

Peak numbers usually occur from mid January onwards, but this year we had our second lowest January count in 18 years (3,320), with the lowest being 2,635 in 2002. Having recently received Derek Forshaw's Lancashire report it is easy to see where they were! The low numbers continued, on February 20th we had 7,750 and on March 20th there were 8,022. In several past years at least one count in either month exceeded 12,000. The counts from Caerlaverock Merse and Rockcliffe Marsh were below average by the greatest amount. At this time most Pinkfeet were feeding on and around the Moricambe Bay marshes of Newton, Border, Calvo and Skinburness. By April, numbers were more typical, with 2,650 counted on the 17th.

Pink-footed Geese seem to react to various conditions and the low counts of 2002 were attributed to the very rough condition of the salt marshes caused by the loss of all grazing cattle and sheep during the outbreak of Foot and Mouth Disease in 2001. Indeed, cattle numbers have not been restored to the pre-FMD levels and most of the marshes and merses around the Solway are still under-grazed in terms of the preferred conditions of Pinkfeet. We have always considered that the only way to get a reasonable estimate of the number of Pinkfeet using the Solway area is to count them as they flight off the estuary at dawn. The count dates are selected to coincide with when low water is at night and there is little or no moon, on the assumption that geese are most likely to flight back to the roosts in these conditions. However, they seem to be contradicting this assumption, and there is now a great deal of anecdotal evidence to suggest that they are roosting inland, especially at Lochmaben and along the River Esk beyond Longtown.

It seems that we now need to find and count these inland areas in order to continue to get accurate estimates of the number of Pinkfeet in the area. We may also need to examine why this is happening. A number of ideas have been suggested, including under-grazing of the marshes, and an increase in the number of sheep out-wintered on the marshes. On the English side, sheep numbers seem to have increased since conservation measures to prevent over-grazing on the Lakeland Fells were introduced. The increase in the number of Barnacle Geese is also believed to be another possible reason. Certainly on the Moricambe Bay marshes, the number of Barnacle Geese in recent years has risen to over 4,000 and they graze quite extensively from November through to April. The pressure from shooting and scaring is a further quoted reason. They are shot on the marshes until 20th February so until that time they feed on adjacent farmland. When shooting ends they feed on the marshes until the grass runs out and then they hop over the hedges onto adjacent fields. There have been changes in agriculture that may be influencing the fields they feed on inland.

There seems to be a whole range of factors contributing to the presumed changes in how this goose uses the Solway Firth. These marshes are extensive and are important areas for the geese and it would seem that some investigation into the cause of the apparent decline in numbers using the Solway Firth is called for.

Frank Mawby

Health and physiology of migrating Greenland White-fronted Geese

Although aspects of Greenland White-fronted Goose ecology and behaviour have been well studied, little is known of their health status, or the physiology of the birds during migration. To address this, two investigative trips were undertaken in 2001 and 2004 during their autumn-staging in western Iceland.

The aims were to identify the nature and prevalence of any diseases, provide a baseline for future health monitoring, and ultimately quantify the impact of disease on survival and productivity of marked birds. In addition, we aimed to investigate whether the organs change significantly in size during this migratory stop-over, in a similar way to that known to occur in some wader species.

Ruth Cromie and David Stroud examining Greenland White-fronted Goose carcasses (Alyn Walsh)

During both trips, birds were cannon-netted and blood, faecal and ectoparasite samples were taken together with biometric measurements to work out a body condition index. Arnór Sigfússon liaised with hunters and generously provided many carcasses (minus the tasty bits!) that were then subject to *post mortem* examination. During 2001, 74 live geese and eight dead geese were examined and in 2004, samples from 53 live geese and 26 dead geese were obtained.

As expected, the juvenile birds had a significantly higher prevalence of disease than the adults, with higher levels of feather lice and associated feather damage, and gape worms. Such diseases may have an effect on condition and certainly gape worms may have a direct effect on survival, particularly in these young birds.

In both years, approximately 74% of birds were infected with gizzard worms. However, only some of these had notable tissue damage and gizzard erosion. Similarly, during both years, about 13% of birds were found to have non-specific signs of 'infection' although this was not related to body condition. No cases of avian tuberculosis were found.

Abdominal profile index (API) of birds in the field (a measure of how fat a bird is) showed a steady increase over time as might be expected as the birds refuelled prior to the next migration leg to Ireland. Looking at the insides of dead birds, this was reflected with an increase, over time, in fat beneath the skin, around the gut, and around the cloaca (this is the fat depot that contributes most to the API). However, no clear picture was seen of changes in organ size or gut length – more research is obviously needed!

In conclusion, a number of diseases were identified and continued monitoring of these is now needed, alongside analyses of the fate of marked birds, in order to provide an important understanding of the impact of such disease at population level. With thanks to David Stroud, Tony Fox, Alyn Walsh, Phil Shepherd, Raffaella Cecchi and Hikari Osaki for their help with this work.

Ruth Cromie

Good news from Iceland

Although controversy continues over the impacts of two major hydro-electric developments in Iceland which will lead to damage or destruction of key Pink-footed Goose feeding, breeding and moulting habitats, some good news has also come from Iceland. The Myvatn-Laxá wetland complex in northern Iceland is an ecologically rich area supporting large numbers of waterbirds, including high concentrations of Harlequin Duck and Barrow's Goldeneye. Whooper Swans also use the wetland for feeding and moulting. Despite designation as a wetland of international importance under the Ramsar Convention, extraction of diatomite sediment from Lake Myvatn has occurred for many years. Concerns over the damaging effects of dredging on the complex ecosystem, and associated impacts on waterbird distribution, led to an international effort to raise awareness of the threats to this important habitat. Within the last year, however, news arrived that the diatomite factory had closed due to financial reasons, and pipes used for sediment extraction had already begun to be removed. It is hoped long-term monitoring studies will show good recovery of this complex and important habitat.

Source: *Wildfowl & Wetlands* Spring 2005

The 'Supergoose' Project

This year has seen the start of a new and exciting phase of the WWT's East Canadian High Arctic (ECHA) Light-bellied Brent Goose conservation research programme. This work, entitled *Supergoose*, is focused around further satellite-tracking of these geese from Ireland and Iceland to Canada, and is being undertaken in collaboration with BBC Northern Ireland, who are providing vital support for promotional and educational elements of the work, including a series of documentaries involving filming throughout the flyway and regular radio updates on BBC Radio Ulster. Other long-term partners in Ireland, Iceland and Canada continue to be involved, providing a truly international and co-ordinated approach to the study and conservation of this population.

ECHA Light-bellied Brent Geese undertake perhaps the longest migration of all geese – a 4,000 km journey from their wintering grounds in Ireland to breeding areas in the Queen Elizabeth Islands of northern Canada that involves three ocean crossings and a 700 km flight over the vast Greenland ice-cap. The identification and protection of key staging sites is therefore critical for the conservation of these birds. The *Supergoose* project is already providing further information on the location of staging and breeding areas and how these sites are used by the birds, as well as the hazards encountered in different parts of the flyway. In previous years, one goose with a transmitter was found in an Arctic Fox den, and a second in the hut of an Inuit hunter!

Kendrew Colhoun (left) and Gregor Watson (right) holding Brent Geese (Graham McElwaine)

Supergoose kicked off on 18 May, when 23 birds were caught in Iceland and six fitted with 35 g satellite transmitters (four were battery-powered, on continuous transmission, and two are solar-powered with data downloads every four days). A further four birds fitted with transmitters at Wexford, in southern Ireland, on 1 April, meant a total of ten individuals would hopefully be tracked to Canada. Most successfully completed the migration, and their migratory flights can be viewed, on maps such as the one below, on the WWT website http://www.wwt.org.uk/supergoose/.

All satellite-tracking to date has focussed on the spring migration, so far less is known about the return flight in the autumn. Whilst the two solar-powered transmitters should continue signalling for some time, the battery-powered transmitters stopped transmitting soon after the birds arrived in Canada. Therefore, an expedition to catch Brent Geese on the breeding grounds is planned for August 2005, and it is hoped to fit a further five transmitters that will provide the first comprehensive record of the southbound flight via Greenland and Iceland to Ireland. By the time this newsletter is published, the expedition should have just been completed, and the tracks of these Ireland-bound birds will also be appearing on the WWT website as they occur.

Kendrew Colhoun & Eileen Rees

Goose Specialist Group meetings

The 9th annual meeting of the Wetlands International/IUCN-SSC Goose Specialist Group will be held from 5-9 November 2005 in Sopron, Hungary. Further details and a registration form can be found at http://www.wetlands.org/networks/Goose/Goose.htm

Waterbird Review Series

This series, which is now published with the exception of Greenland Barnacle Goose, is now available from the WWT website, although the URL is not as given in *GooseNews* 3, but is http://www.wwt.org.uk/research/waterbirdreviews/

Within-winter movements and site fidelity of Iceland Greylag Geese

Bob Swann and co-authors from the Highland Ringing Group, WWT and the Icelandic Institute of Natural History investigated movements of Iceland Greylag Geese in northern Britain. They used sightings of marked individuals reported between 1992 and 2001, including over 12,000 observations of birds marked at Loch Eye and over 3,000 of birds marked in Iceland.

Results showed that greatest mobility and highest turnover occur in early winter, while the lowest occurred during mid winter. The majority of marked birds first arrive in northern Scotland, with the Moray Firth being a key arrival site. Dispersal then occurs throughout October and November, northwards to Caithness and southwards to Aberdeenshire and central Scotland, as well as to Co. Donegal in Ireland. By December, sightings were found to increase in central and southern Scotland, and northeast England as far south as Cleveland and North Yorkshire. Declines in sightings occurred at the Moray Firth, Caithness and Aberdeenshire during this time but a coincident increase was found in Orkney, east- and west-central Scotland and the Solway. In Spring, some northerly movement was detected in March and early April, but the data suggest that most birds depart directly from their final wintering areas without prior movement northwards in Britain.

In October and early November, geese preferentially feed on spilt grain on stubble fields. Mobility was found to be high at this time, possibly as a result of variability in food availability. It is possible that the population is widely dispersed during these months, perhaps with a number of temporary roost sites in use. In late December, there is a switch to feeding on winter cereals and grass, with geese becoming less mobile and more concentrated in areas close to traditional roost sites. Some birds continue to move between regions perhaps reacting to disturbance or employing an advantageous strategy to locate new feeding opportunities.

Source: Swann, RL, IK Brockway, M Frederiksen, RD Hearn, C Mitchell & A Sigfússon. Within-winter movements and site fidelity of Icelandic Greylag Geese *Anser anser*. *Bird Study* 52: 25-36

Goose action plans near completion

The review and adoption of International Species Action Plans at the 3rd Meeting of the Parties to the African-Eurasian Waterbird Agreement, to be held in Dakar, Senegal on 23-27 October 2005, is eagerly awaited for two goose populations: East Canadian High Arctic Light-bellied Brent Goose and Lesser White-fronted Goose. These action plans will help to raise the profile of the conservation needs for these two goose populations. Further news on this meeting can be found on the AEWA website: http://www.unep-aewa.org/meetings/en/mop/mop3_docs/mop3_papers.htm.

Feeding preferences of pre-breeding geese in Svalbard

Increases in most Arctic-breeding goose populations over recent decades have given rise to increased grazing pressure on the Arctic tundra. Competition for resources can dramatically influence the distribution and abundance of sympatric goose species and may affect the carrying capacity of the tundra habitat. Previous studies have shown interspecific competition for resources on the moulting grounds in Greenland, with Barnacle Geese showing sub-dominance to Pink-footed Geese. Both species also occur together prior to nesting on Svalbard where competition for food resources at a time when high levels of nutrients are required for egg production may affect reproductive output.

Tony Fox and Espen Bergersen have recently shown, however, that there was no competitive or avoidance behaviour during the pre-breeding period in Svalbard. In fact, there was no dietary overlap even though feeding patterns and foraging times were similar. Barnacle Geese were found to graze primarily on moss-mat habitats on the very edges of snow cover, while Pink-footed Geese grubbed for below-ground storage organs across a range of habitats in snow-free areas. They concluded that increasing goose numbers should have no interspecific effects due to dietary overlap, assuming goose densities do not physically affect the vegetation composition and therefore resource availability of the tundra ecosystem.

Source: Fox, AD & E Bergersen. 2005. Lack of competition between barnacle geese *Branta leucopsis* and pink-footed geese *Anser brachyrhynchus* during the pre-breeding period in Svalbard. *Journal of Avian Biology* 36: 173-178

Canada Goose split accepted by AOU

The 45th Supplement to the American Ornithologist's Union Checklist, published in *Auk* 121, officially announced that Cackling Goose is now considered a separate species from Canada Goose, as follows:

Cackling Goose *Branta hutchinsii* includes the subspecies *hutchinsii* (Richardson's), *asiatica* (Bering – probably extinct), *leucopareia* (Aleutian), *taverneri* (part of the Lesser complex), and *minima* (Cackling).

Canada Goose *Branta canadensis* now includes the subspecies *canadensis* (Atlantic), *interior* (Interior), *maxima* (Giant), *moffitti* (Moffit's/Great Basin/Western), *parvipes* (the other part of the Lesser complex), *fulva* (Vancouver), and *occidentalis* (Dusky).

The Checklist committee indicates that more splits of this complex may be yet to come. An excellent overview of this issue can be found at http://www.oceanwanderers.com/CAGO.Subspecies.html#web

Post ice-age colonisation of Pink-footed Geese

Much of the current range of Pink-footed Goose includes areas that were covered by glaciers in the last ice age. Two populations currently exist: those breeding in Iceland and Greenland, and those in Svalbard. Many years of debate on the evolutionary histories of these populations prompted researchers from Finland, Norway and Denmark to investigate different historical scenarios by examination of DNA sequence variation from samples collected between 1864 and 2003.

The results suggest that the two populations separated after the last glacial period. Significant differentiation in genetic sequences among the two populations, and higher diversity in the Svalbard population, suggest that the present Iceland/Greenland population originated by expansion from part of the Svalbard population. The population size during the late Pleistocene was estimated to be around the size of the current Svalbard population (32,000-37,000) – thought to be too large for possible glacial refugia in Greenland, Iceland, Svalbard and Norway to support during this time. Large areas of tundra-like habitat in regions south of the northern European ice sheet are a probable alternative. Indeed, limited fossil records show that western Europe was a possible breeding area for Pink-footed Geese during the late Pleistocene.

Source: Ruokonen, M, T Aarvak & J Madsen. 2005. Colonization history of the high-arctic pink-footed goose *Anser brachyrhynchus*. *Molecular Ecology* 14: 171-178

Continued decline of Dark-bellied Brent Geese

The latest results from the International Census of Dark-bellied Brent Geese show that this population is continuing to decrease, with numbers now at their lowest level since 1988. The co-ordinated count in January 2003 revealed a total of 196,848, the first time for fifteen years that the number has been below 200,000. Other monitoring activities indicate that this is largely a result of a series of poor breeding seasons, rather than increased mortality (see page 7 for an update on this work in the UK). The characteristic boom years, which occurred once every three years following peak breeding years for lemmings, no longer occur. In these years, the proportion of young in winter flocks reached 30-50%, but now it is typically around 10%, below the level of annual mortality (c.15%). Consequently, a new three-year research project aiming to improve understanding of the population dynamics of this population, in particular the reproductive success and those factors that regulate it, has been initiated by Alterra (http://www.alterra.wur.nl/UK/). Fieldwork in the Russian arctic is ongoing, and further results will be reported in future issues of *GooseNews*.

Source: Ebbinge, B. 2005. Lemming link to goose puzzle. *Arctic Bulletin* 4.04

Proposed SPA at Slamannan Plateau

In March 2005, the Scottish Executive announced 11 proposed additions to the network of Special Protection Areas in Scotland. Among them was the Slamannan Plateau, where the proposed SPA would protect the largest flock of Bean Geese in the UK. The proposed additions are now subject to consultation with owners, occupiers and other local interests, after which by Scottish Natural Heritage will recommend whether the site should be classified.

The Greylag Geese of Utterslev Mose

This special issue of *Dansk Ornitologisk Forenings Tidsskrift* by Kaj Kampp and Niels Otto Preuss provides a detailed overview of a 35-year study of the Greylag Geese that breed in the Utterslev Mose area of Copenhagen. Despite breeding in an urban environment, these birds are part of the migratory population that over-winters predominantly in Spain. The study began in 1959, making it the first long-term study of goose biology and population dynamics to be initiated. This report covers the basic demographic parameters such as trends in abundance, productivity and survival, as well as more detailed individual aspects such as mate fidelity, senescence, lifetime reproductive success, natal and breeding philopatry, and adoption. As such, it provides what is probably the most detailed study of a Greylag Goose population to date and will be of interest to people studying this species in the future.

Source: Kampp, K & NO Preuss. 2005. The Greylag Geese of Utterslev Mose – a long term population study of wild geese in an urban setting. *Dansk Ornitologisk Forenings Tidsskrift* 99: 1

Birds in Europe 2

Birds in Europe 2 is BirdLife International's second review of the conservation status of all wild birds in Europe. Like its 1994 predecessor, Birds in Europe (BiE1), it identifies priority species (Species of European Conservation Concern, or SPECs) for conservation action. The data used derive from fieldwork carried out by thousands of ornithologists, many working as volunteers as for the Goose Monitoring Programme. In total, some 14,000 population/trend records were received, many of which provided an improvement in quality over those used in BiE1.

Of the 524 species assessed, 226 (43%) were classified as Species of European Conservation Concern. This is an increase since BiE1, when 195 species (38% of the 511 assessed) were classified as SPECs. There are currently 20 species of wildfowl classified as SPECs including Brent Goose, Red-breasted Goose, Lesser White-fronted Goose and Tundra Swan. For further information, including a searchable database, visit http://www.birdlife.net/action/science/species/birds_in_europe/index.html

The State of the UK's Birds 2004

The most recent edition of 'State of the UK's Birds' reports a rise in the number of species of waterbird in decline, with nine showing a decrease in the short term and 19 over the long term. European White-fronted Goose shows the most serious long-term decline. A marked shift in the winter distribution is implicated, rather than a genuine decrease in abundance, since this trend is not evident at a flyway scale. Although more abundant than 30-40 years ago, Iceland Greylag Goose and Dark-bellied Brent Goose both remain in short-term decline, emphasising the importance of continued monitoring of these populations. Bewick's Swan shows the most concerning short-term decline; numbers in recent winters were the lowest since the mid 1970s. The results of the 2005 International Swan Census should help to determine whether this is a result of a decline in overall abundance, or whether the trend reflects a redistribution in the wintering range.

The State of the UK's Birds 2004 has been recently published, and will be available to download from WWT's website by the end of August.

Species	Long-term trend (35 year)	Short-term trend (10 year)
European White-fronted Goose	-78%	-50%
Bewick's Swan	-1%	-75%
Iceland Greylag Goose	23%	-23%
Dark-bellied Brent	206%	-30%

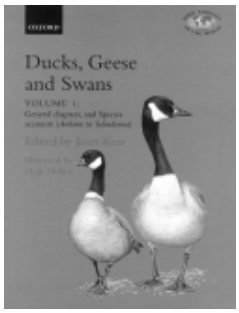
Factors affecting the behavioural responses of Whooper Swans to human activities

The effects of human activity on bird behaviour and distribution have been studied extensively in recent years, but variation in their response to disturbance is still poorly understood. Eileen Rees and colleagues analysed variation in the behaviour of wintering Whooper Swans to determine whether their susceptibility to human activity changes with time, location and the type of disturbance involved. Overall, the swans' feeding activity varied within and between years, and in relation to feeding site, but there was less variation in the amount of time spent alert. Disturbance frequency due to human activity was negatively correlated with flock size and with the distance to the nearest road or track. Distances that humans could approach before alerting the birds similarly varied with field characteristics (ie size and proximity to roads or tracks), and also with the type of disturbance involved. The swans appeared to habituate to human activity within a day, but there was no evidence for longer-term habituation to disturbance levels. The time taken for the birds to resume undisturbed behaviour varied with the duration of the disturbance event, which in turn depended on the type of disturbance involved, with pedestrians alerting the birds for longer periods than vehicles and aircraft. Recovery rates following disturbance were also associated with field size, flock size and the proportion of the flock alerted. Feeding activity was influenced by a range of variables, including year, season, field location, crop type and the number of days that the flock had used the field, with disturbance factors modifying the proportion feeding per hour. Conversely, alert activity was influenced mainly by disturbance events. The range of factors influencing the swans' feeding behaviour, and variability in their response to human activity, has implications for management programmes and for attempts to predict the effects of human activity on the birds at a local and larger scale.

Source: Rees EC, JH Bruce & GT White. 2005. Factors affecting the behaviour of Whooper Swans (*Cygnus c. Cygnus*) to various human activities. *Biological Conservation* 121: 369-382

Ducks, Geese and Swans

Janet Kear's book, *Ducks, Geese and Swans*, was launched on the 3 March 2005 at the London Wetland Centre. Sadly Janet passed away in November last year – many family, friends and former colleagues attended the launch to celebrate her life and her work. The book was a major project compiling and editing contributions from 73 wildfowl experts – a massive achievement taking 13 years to complete.



Ducks, Geese and Swans forms part of the Oxford University's Press series Bird Families of the World. Presented as two volumes, the book opens with eight informative chapters giving an overview of all aspects of wildfowl biology including, taxonomy, evolution, behavioural studies, movements and migration, population dynamics and conservation and management issues. This section is followed by detailed accounts of 165 species, accompanied by beautifully illustrated colour plates by artist Mark Hulme.

Geese and swans are covered well with each account giving a detailed species description, including field characteristics and voice. Breeding, moulting and wintering areas are described for individual populations accompanied by maps showing range and, where appropriate, migration patterns, based on the latest ringing data. This is followed by information on feeding and habitat use in both wintering and breeding areas, as well as behaviour and life cycle. The dynamics of each population are discussed along with factors and threats affecting the conservation status. Previously unpublished data are included making this impressive book the most up-to-date and authoritative guide – a must for any wildfowl enthusiast.

Pair formation in Snow Geese

The timing of first pair formation has an important influence on population structure and dynamics, particularly for migratory geese that exhibit long-term monogamy. The time of year when pairing takes place influences the degree of genetic mixing of neighbouring populations, and the age at which pairing occurs directly influences population growth rate by setting a lower limit on first age of breeding.

Barbara Ganter and co-authors from Canada, Russia and the UK investigated pair bond formation in Snow Geese breeding in the Russian High Arctic (on Wrangle Island) by observing the behaviour of young, known-age birds marked with neck collars over three winter seasons. They found that High Arctic Snow Geese do not tend to form pairs until their third or fourth year. Most pairing took place on the wintering grounds; however, a small proportion paired during spring migration or summer, particularly during 2001 when unusually favourable conditions were experienced on the breeding grounds.

Differences in pair bond formation between a previously studied Low Arctic population (from La Perouse Bay) and this population were also found. High Arctic birds formed pairs much later than Low Arctic birds, which mostly pair in their second year. Successful breeding is possible in most years in the Low Arctic population, whereas the High Arctic population frequently suffers near complete breeding failures because of the harsher climate. Breeding at a young age carries a cost in terms of successful breeding the following year and it may be advantageous for young birds to remain in family groups longer. Variable breeding output will also influence the annual age structure of unpaired birds and hence the pool of potential mates.

The findings of this paper highlight an important component of population models. GSMP fieldworkers can help in the understanding of pair formation for UK-wintering geese by recording details of the social status of marked birds when observing them in the field, ie *has the marked bird got a mate and/or goslings?*

Source: Ganter, B, WS Boyd, VV Baranyuk & F Cooke. 2005. First pairing in Snow Geese *Anser caerulescens*: at what age and at what time of year does it occur? *Ibis* 147: 57-66

Barnacle Geese (WWT)

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 that can be sent via e-mail. If you would prefer to receive *GooseNews* in an alternative format, please contact WWT geese@wwt.org.uk.

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

GSMP contact

Richard Hearn
Waterbird Monitoring Unit, WWT, Slimbridge, Glos. GL2 7BT
T 01453 891185
E Richard.Hearn@wwt.org.uk

Contributors

John Bowler is RSPB's Conservation Officer on the Isle of Tiree, Argyll
E john.bowler@rspb.org.uk

Kendrew Colhoun co-ordinates the All-Ireland Light-bellied Brent Goose Census for the Irish Brent Goose Research Group, and WWT's Light-bellied Brent Goose conservation research
E Kendrew.Colhoun@wwt.org.uk

Ruth Cromie is WWT's Waterbird Biology Research Manager
E Ruth.Cromie@wwt.org.uk

Tony Fox co-ordinates the National Census of Greenland White-fronted Geese in Britain
E tfo@dmu.dk

Colette Hall is a Waterbird Monitoring Officer at WWT Slimbridge
E Colette.Hall@wwt.org.uk

Frank Mawby is the Local Organiser of goose counts on the Solway Estuary
E FrankMawby@aol.com

Julia Newth is the Bewick's Swan Project Assistant at WWT Slimbridge
E Julia.Newth@wwt.org.uk

Helen Rowell is a Waterbird Monitoring Officer at WWT Slimbridge
E Helen.Rowell@wwt.org.uk

Mark Trinder is a Population Ecologist at WWT Slimbridge
E Mark.Trinder@wwt.org.uk

Jenny Worden is a Waterbird Monitoring Officer at WWT Slimbridge
E Jenny.Worden@wwt.org.uk

Happy birthday AEWA

This year marks the 10th anniversary of the African-Eurasian Waterbird Agreement – an international agreement that calls for coordinated measures to conserve migratory waterbirds in favourable status across their range. At present, 117 countries have agreed to engage in a wide range of conservation actions, including research, monitoring and the establishment of a protected network of suitable habitats at a flyway scale.

A number of events have been initiated to mark this occasion. The AEWA Waterbird Conservation Award will recognise and honour institutions and individuals within the Agreement area that have significantly contributed towards the conservation and sustainable use of waterbirds. The US $5,000 award will be presented triennially and in 2005 will consist of two categories – institutional and individual. Nominations are welcomed for government and non-government organisations, enterprises and individuals that have made a significant contribution towards long-term conservation and sustainable use of waterbirds.

The AEWA Secretariat has also launched a new e-newsletter, with the very first issue celebrating this historical date. The e-newsletter will be sent out by the Secretariat on a monthly basis, and will provide information on news, events and conferences. Anyone wishing to subscribe should visit the AEWA website http://www.unep-aewa.org/news/latest_news.htm.

Finally, AEWA Executive Secretary Bert Lenten declared the first International Migratory Waterbird Days to take place on 9th and 10th April 2005, stating that 'these new Commemoration days want to draw the attention of the public and the authorities to the importance of conservation actions at the national and local level as an integral part of the flyway conservation of migratory species'. A range of outreach materials promoting the conservation of the migratory birds has also been produced carrying the new AEWA logo and various migratory species.

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WWT JOINT NATURE CONSERVATION COMMITTEE

Goose & Swan Monitoring

The Goose & Swan Monitoring Programme is organised by the Wildfowl & Wetlands Trust (WWT) on behalf of WWT and the Joint Nature Conservation Committee.