



SVALBARD PINK-FOOTED GOOSE

Population Status Report 2013-2014

Technical Report from DCE – Danish Centre for Environment and Energy

No. 39

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Data sheet

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- Abstract: This report compiles annual monitoring data on the population status of the Svalbard pink-footed goose for the season 2013-14, which is used to monitor the population development and provide input data to the modelling of an optimal harvest strategy for the population for the coming hunting season (2014-15). This is part of an adaptive harvest management framework set up to support the implementation of the AEWA International Species Management Plan for the population. The estimated population size (May 2014) was 76,000 individuals, which is a decrease compared to 2013. The proportion of juveniles in the population (October 2013) was close to the long-term average, namely 11.8%. The number of pink-footed geese harvested in Norway and Denmark in the 2013 hunting season was c. 11,100.
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1 Aim

The aim of this report is to compile annual monitoring data on the population status of the Svalbard pink-footed goose for the season 2013-14. Data is used to monitor the population development and provide input data to the modelling of an optimal harvest strategy for the population for the coming hunting season (2014-15). This is part of an adaptive harvest management framework set up to support the implementation of the AEWA International Species Management Plan for the population (see Madsen and Williams 2012; Johnson and Madsen 2013). Data from the season 2012-13 have been published in a previous report (Madsen et al. 2013).

We thank the national volunteer networks who contributed with counts to this report as well as the Danish Nature Agency and Statistics Norway for supplying preliminary hunting bag statistics.

2 Population estimate 2013-14

Internationally coordinated population counts were performed on 3 November 2013, 27 April 2014 and 4 May 2014. Counts were coordinated as closely as possible to the date and, in April and May 2014 in Trøndelag, mid Norway to the middle of the day, because of previous experience with flocks moving between sites with the risk of double counting. In November, when the population is distributed throughout the non-breeding range, from Trøndelag in mid Norway in the north, through Denmark, The Netherlands and south to Belgium (as well as scattered flocks in southern Sweden), flocks were either counted when they were leaving the roost sites in the morning, arriving to roost sites in the evening, or on the fields. In April/May, when the population is concentrated in Trøndelag and Vesterålen, Norway and Jutland in Denmark, counts in Trøndelag were targeted to the middle of the day when the majority of geese stay on the roost sites. Counts were performed by a local team of observers; however, information from sites outside the range of counting, such as the migration corridor through southern part of Norway, was derived from online data sources (<http://artsobservasjoner.no/fugler>). Counts from Sweden were solely derived from the online reporting system Svalan (<http://svalan.artdata.slu.se/birds>).

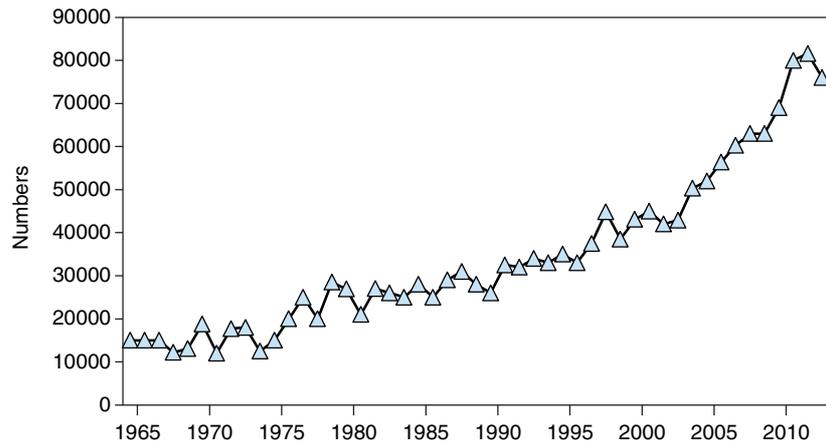
The counts are summarized in Table 1. In early November 2013, a total of 67,600 geese was counted, with the majority (70%) staging in Denmark, followed by Friesland in The Netherlands (24%). In late April 2014, a total of 75,802 was counted, with geese concentrating in Trøndelag in mid Norway (95%); in early May, around 4,000 less geese were observed, still with the vast majority in Trøndelag (93%). The observers in Trøndelag judged that count coverage was good on 27 April when geese were mostly found on the roost sites with little sign of exchange between sites; the risk of double counting was therefore minimal. On 4 May, geese were also on the roosts; however, in one main area, geese were missing and could not be found in the surrounding fields either. In early November, it appears that 8,000 geese (or less as geese have also died from mortality including hunting and natural causes during November-April) were missing compared to the spring counts; this is similar to the situation witnessed in the previous season. Hence, it suggests that in autumn geese are using sites which have not been covered by the counts. One such area may be the Danish Wadden Sea, where a flock of up to 1,000 pinkfeet was recorded in the Ballum area in October and 350 on the count date in early November. This is highly unusual. Geese may also use sites not currently covered in north Jutland, and we need to extend the coverage in the coming years to keep track of all potential goose sites.

In summary, the population estimate (rounded to the nearest 1,000) for the 2013/14 season is 76,000 geese. The population seems to have stabilized or even declined for the first time during the recent decade (Fig. 1).

Table 1. Results of synchronized counts of pink-footed geese in autumn 2013 and spring 2014.

Country	Region	Numbers		
		3 Nov. 2013	27 Apr. 2014	4 May 2014
Norway	Trøndelag	813	71,813	66,552
	Vesterålen	0	1011	1,875
	Other sites	21	529	486
Denmark	N Jutland	21,398	2,112	2,389
	W Jutland	25,360	227	104
	SW Jutland	350	0	0
Sweden	Various sites	360	110	96
Netherlands	Friesland	16,421	0	0
Belgium	Flanders	2877	0	0
TOTAL		67,600	75,802	71,502

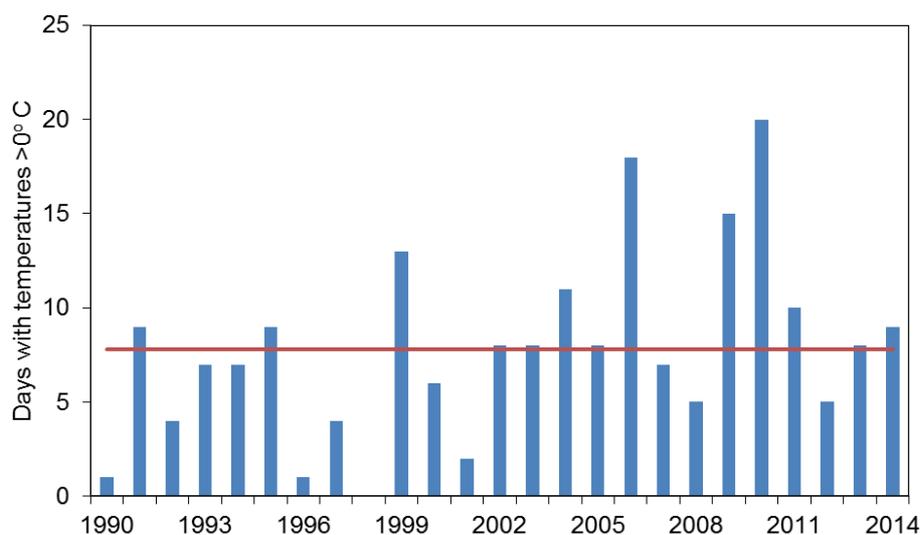
Figure 1. Development of the size of the Svalbard pink-footed goose population, 1965/66-2013/14.



3 Productivity autumn 2013

The overall productivity of high-Arctic pink-footed geese can be predicted using the number of thaw days in May (number of days with mean daily temperature above 0°C) or snow coverage by the end of May (Jensen et al. 2014). The mean daily temperatures are derived from Ny Ålesund and Svalbard Airport meteorological stations (www.eklima.no). In May 2013, Ny Ålesund had 7 thaw days and Svalbard Airport had 9 thaw days, hence an average of 8 thaw days. This is just above the long-term average for 1990-2014, which is 7.8 (Fig. 2). We predicted that this would result in an average production of young in 2013.

Figure 2. Number of days with average daily temperatures in May in Svalbard as an expression of the spring conditions for breeding, 1990-2014. The data shows an average of temperature days for Ny Ålesund and Svalbard Airport, Longyearbyen. The long-term average is shown by a red line.



The subsequent productivity in the population of pink-footed geese was recorded in The Netherlands, Denmark and Norway during the autumn of 2013. We used data from 13 October to 4 November to estimate the proportion of juveniles in the goose flocks. The proportion varied between 10.5% (in W Jutland, Denmark) and 19.2% (in Norway). This pattern is similar to what has been found in previous years. To derive an overall estimate, the proportion of juveniles has been weighted against the approximate number of geese staying in Norway, Denmark and The Netherlands, respectively, during late October/early November 2013 (Table 2). The overall proportion of juveniles in the population was thus 11.8% which is below the long-term average of 14.5% (1980-2013; Fig. 3).

Table 2. Proportion of juveniles in the population of pink-footed geese in Norway, Denmark and The Netherlands during autumn 2013, and an estimate of the overall population-wide proportion of juveniles, based on the approximate late October/early November distribution between countries. Counts were performed by Paul Shimmings (Norway), Ole Amstrup, Jørgen Peter Kjeldsen, Mogens Bak (Denmark) and Fred Cottaar (The Netherlands).

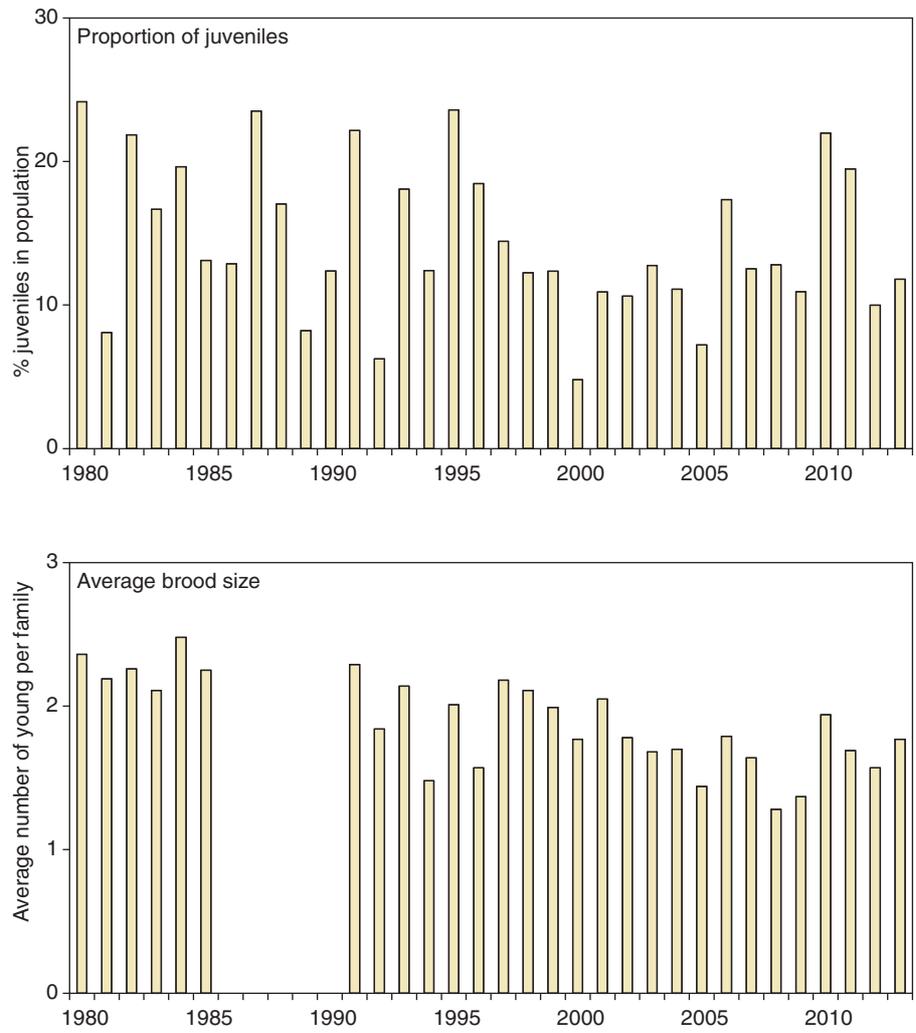
Country	Numbers counted	Number of juvs.	% juvs.	Numbers in early Nov.	Estimated number of juvs.
Norway	1,310	252	19.2	813	156
N Jutland, DK	9,050	952	11.8	21,389	2,516
W Jutland, DK	4,802	502	10.5	25,360	2,651
The Netherlands	7,867	1,061	13.5	16,421	2,215
TOTAL	23,029	2,767		63,992	7,538
				% juvs. weighted	11.8

Brood sizes were recorded in Norway, Denmark and The Netherlands during September-October 2013. Results are summarized in Table 3. There is a significant difference between countries (one-way ANOVA, $p < 0.001$). A Post hoc test (Tukey's Multiple Comparison Test) shows that there is a significant difference between Denmark and Netherlands and Norway, while there is no significant difference between Norway and Netherlands. A pooled estimate is presented, with an average of 1.76 young per family (Table 3). Brood size has decreased over the long-term (Fig. 3); however, there is a tendency for a recent increase.

Table 3. Mean brood sizes (\pm std) recorded in Norway, Denmark, The Netherlands and the total for all countries during autumn 2013. Counts were performed by Paul Shimmings (Norway), Ole Amstrup and Mogens Bak (Denmark) and Fred Cottaar (The Netherlands).

Country	Mean	Sample	std
Norway	1.84	76	1.01
Denmark	2.17	131	1.10
The Netherlands	1.63	462	0.91
TOTAL	1.76	669	0.97

Figure 3. Productivity in the population of pink-footed geese, expressed by the proportion of juveniles in the population in autumn and average brood size, 1980-2014.



4 Harvest in Norway and Denmark 2013

Data on hunting bags from Norway for the autumn 2013 has been supplied by Statistics Norway (www.ssb.no) (Trond A. Steinset pers. comm., communicated via the Norwegian Environment Agency). Hunting bags from Denmark have been derived from the National Hunting Bag Statistics (Aarhus University, Danish Nature Agency)

(<http://bios.au.dk/videnudveksling/til-jagt-og-vildtinteresserede/vildtudbytte>).

For Denmark, species-specific reporting of geese was not used until in recent years, and before 2012, the species distribution was derived via wing collection sampling

(<http://bios.au.dk/videnudveksling/til-jagt-og-vildtinteresserede/vinger/>).

Since 2012, the vast majority of hunters have reported goose hunting bags at species level, and we have therefore decided to switch to this measure because it is based on a much larger sample than the wing collection. This means that the hunting bags for Denmark for 2012 have been changed compared to the previous report (Madsen et al. 2013). The data for 2013 are preliminary since the final evaluation of the national hunting bag has not yet taken place (Table 4).

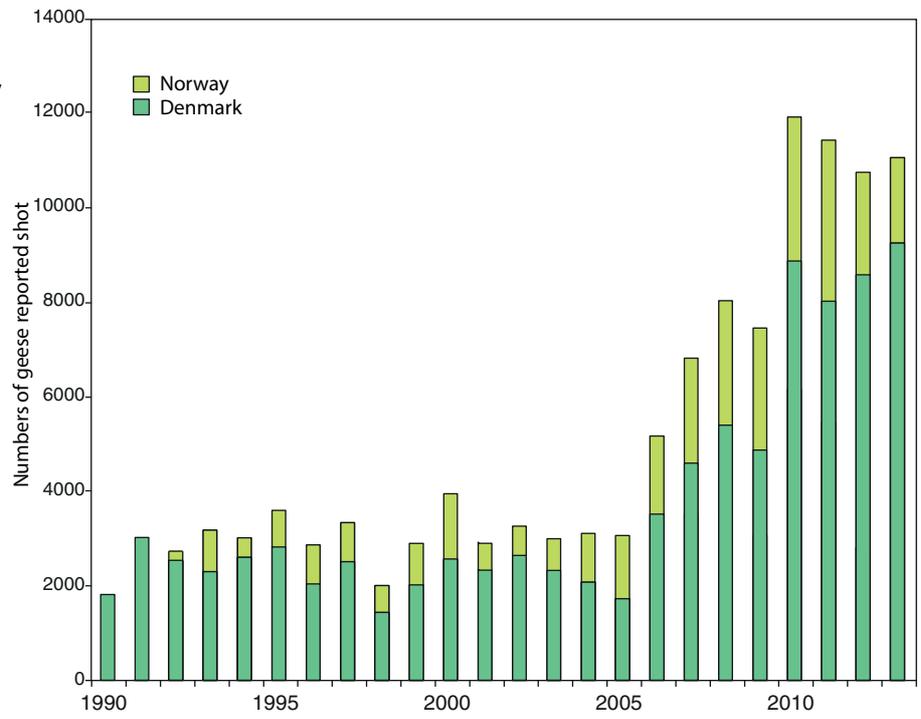
The data shows that in Norway fewer pink-footed geese were shot than in the previous hunting seasons (Fig. 4). In 2012, the bag had also declined which was ascribed to a delayed cereal harvest which meant that a large proportion of cereal fields were not harvested by the time of arrival of pink-footed geese to Nord-Trøndelag during late September and therefore, many flocks passed quickly onwards to Denmark. However, in 2013, most of the fields were harvested by the time of arrival of pinkfeet and this can therefore not explain the reduction. In 2013, fewer pinkfeet than in previous years stopped in Trøndelag and hence, less geese were accessible for hunters (G.H. Jensen unpubl. data).

The numbers of pink-footed geese harvested in Denmark increased slightly compared to the previous year. In summary, the number of harvested geese remained stable, with a preliminary estimate of 11,081 geese reported shot.

Table 4. Hunting bags of pink-footed geese in Norway and Denmark, hunting seasons 2011-2013.

Country	2012	2013
Norway	2,169	1,819
Denmark	8,580	9,262
TOTAL	10,749	11,081

Figure 4. Harvest of pink-footed geese in Denmark and Norway, 1990-2013. Bag statistics for Norway started in 1992. Data from 2013 are preliminary. Sources: see text.



5 Spring weather conditions in Svalbard 2014

For the modelling of optimal harvest strategy for the hunting season 2014/15, we use the weather conditions in May in Svalbard as a predictor of the production of young (Jensen et al. 2014). The mean daily temperatures are derived from Ny Ålesund and Svalbard Airport meteorological stations (www.eklima.no). In May 2014, Ny Ålesund had 6 thaw days and Svalbard Airport had 12 thaw days. For further analysis an average of 9 thaw days will be used which is slightly above the long-term average for 1990-2014, of 7.8 (see Fig. 2). Hence, we predict a breeding season close to the long-term average. However, we observed a huge difference in the snowmelt between the coast (Ny Ålesund) which was late compared to Longyearbyen, where snowmelt progressed very fast during the last 10 days of May. Opportunities for early nesting therefore varied considerably with location.

6 References

Jensen, G.H., Madsen, J., Johnson, F.A. & Tamstorf, M. 2014. Snow conditions as an estimator of the breeding output in high-Arctic pink-footed geese *Anser brachyrhynchus*. *Polar Biology* 37: 1-14.

Johnson, F.A. & Madsen, J. 2013. Adaptive Harvest Management for the Svalbard Population of Pink-Footed Geese. Assessment for the 2013-2015 hunting seasons. Aarhus University, DCE – Danish Centre for Environment and Energy, 20 pp. Technical Report from DCE – Danish Centre for Environment and Energy No. 28 <http://dce2.au.dk/pub/TR28.pdf>

Madsen, J. & Williams, J.H. 2012. International Species Management Plan for the Svalbard population of the pink-footed goose *Anser brachyrhynchus*. – AEWA Technical Report No. 48. African-Eurasian Waterbird Agreement, Bonn, Germany.

Madsen, J., Cottaar, F., Nicolaisen, P.I., Tombre, I., Verscheure, C. & Kuijken, E. 2013. Svalbard Pink-footed Goose. Population Status Report 2012-13. Aarhus University, DCE – Danish Centre for Environment and Energy, 12 pp. Technical Report from DCE – Danish Centre for Environment and Energy No. 29. <http://dce2.au.dk/pub/TR29.pdf>

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