



SVALBARD PINK-FOOTED GOOSE

Population Status Report 2014-2015

Technical Report from DCE – Danish Centre for Environment and Energy

No. 58

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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 2014-15: This data is used to assess the population development and provides input for the modelling of an optimal harvest strategy for the population for the coming hunting season (2015-16). 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 2015) was 59,000 individuals, a 22% decrease compared to 2014. The proportion of juveniles in the population (October 2014) was below the long-term average, namely 10.3%. The number of pink-footed geese harvested in Norway and Denmark in the 2014-15 hunting season was c. 14,800, an increase compared to previous hunting seasons. This was primarily a result of opening hunting on land in January 2015 in Denmark.
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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 2014/15. This data is used to assess the population development and provide input data for the modelling of an optimal harvest strategy for the population for the coming hunting season (2015/16). 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 previous seasons 2012/13 and 2013/14 have been published in separate annual reports (Madsen et al. 2013, 2014).

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 2014/15

Internationally coordinated population counts were performed on 2 November 2014, 26 April 2015 and 4 May 2015. Counts were coordinated as closely as possible to these dates. 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 roost sites in the morning, arriving at roost sites in the evening, or alternatively on fields. In April/May, when the population is concentrated in Trøndelag and Vesterålen, Norway and Jutland in Denmark, counts in Trøndelag were targeted at the middle of the day when the majority of geese stay on the roost sites. However, this was not always the case and geese were also searched for inland. Counts were performed by local teams of observers; however, information from sites outside the counting areas, such as the migration corridor through the 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 2014, a total of 73,670 geese were counted, with the majority (67%) staging in Denmark, followed by Friesland in The Netherlands (15%), Flanders in Belgium (11%) and Norway (6%). In previous years, we had the suspicion that geese were missed in the autumn count, probably in Denmark. The search for geese was intensified in SW Jutland (the Wadden Sea) and north Jutland. In the Wadden Sea, around 13,000 pinkfeet were found, concentrated at roost sites at Ballum Sluse and Kongeås-lusen. These sites may also have been used in earlier years.

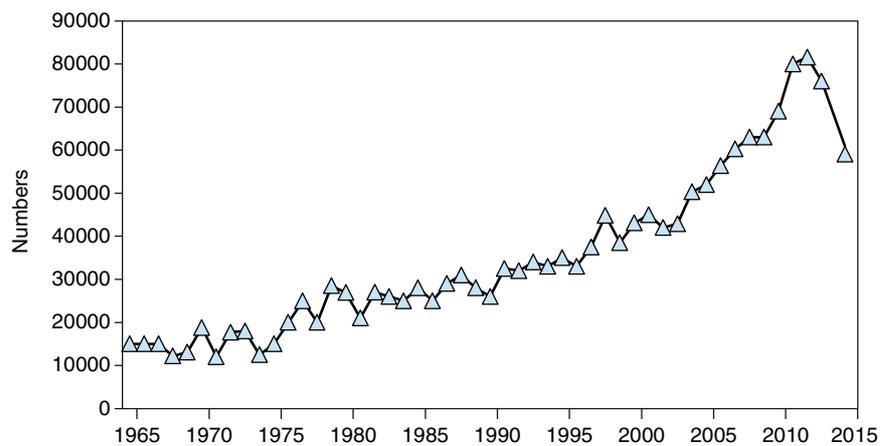
Table 1. Results of synchronized counts of pink-footed geese in autumn 2014 and spring 2015.

Country	Region	Numbers		
		2 Nov. 2014	27 Apr. 2015	4 May 2015
Norway	Trøndelag	3352	50574	55751
	Vesterålen	0	1114	1526
	Other sites	987	1737	123
Denmark	N Jutland	14895	1082	1260
	W Jutland	21640	686	299
	SW Jutland	13055	0	0
	Other sites	11	17	0
Sweden	Various sites	515	60	55
Netherlands	Friesland	10568	0	0
	Midden-Delfland	354	0	0
Belgium	Flanders	8293	0	0
TOTAL		73670	55270	59014

In late April 2015, a total of 55,270 were counted, with geese concentrated in Trøndelag in mid Norway (97%); in early May, around 59,000 was observed, with the vast majority still in Trøndelag (97%). The observers in Trøndelag judged that for both surveys coverage was good, and observers followed routes used in previous years but also searched in surrounding potential areas. It is not possible to judge whether the difference, of approximately 4,000 birds, between the two counts is due to count error or birds missing e.g. on migration.

In summary, the population estimate (rounded to the nearest 1,000) for the spring of 2015 is 59,000 geese. Based on the May count there appears to have been a substantial decline of 14,670 individuals between November and May. This is further evaluated in Chapter 4. The conclusion is that the population has declined abruptly within the last two years (Fig. 1).

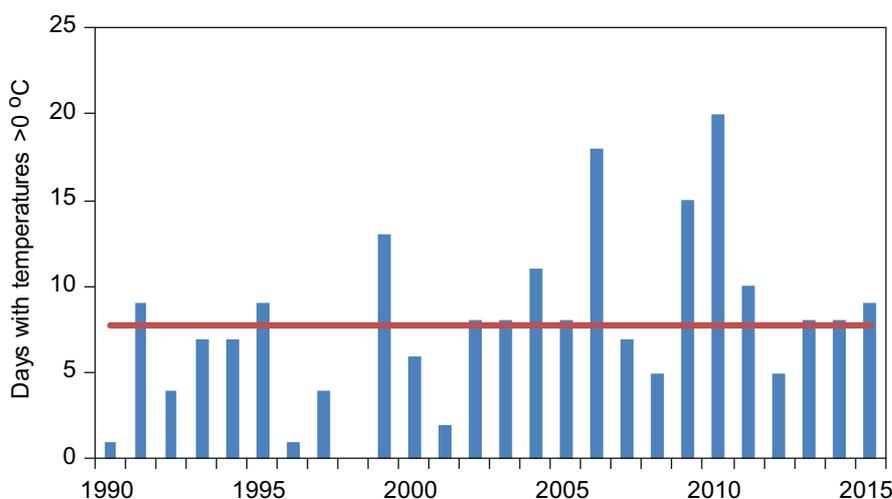
Figure 1. Development of the size of the Svalbard pink-footed goose population, 1965/66-2014/15.



3 Productivity autumn 2014

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 2014, Ny Ålesund had 6 thaw days and Svalbard Airport had 12 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 2014.

Figure 2. Number of days with average daily temperatures in May in Svalbard as a proxy for the spring conditions for breeding, 1990-2015. The data shows the number of days in May with positive daily temperatures, averaged for Ny Ålesund and Svalbard Airport, Longyearbyen. The long-term average is shown by a red line.

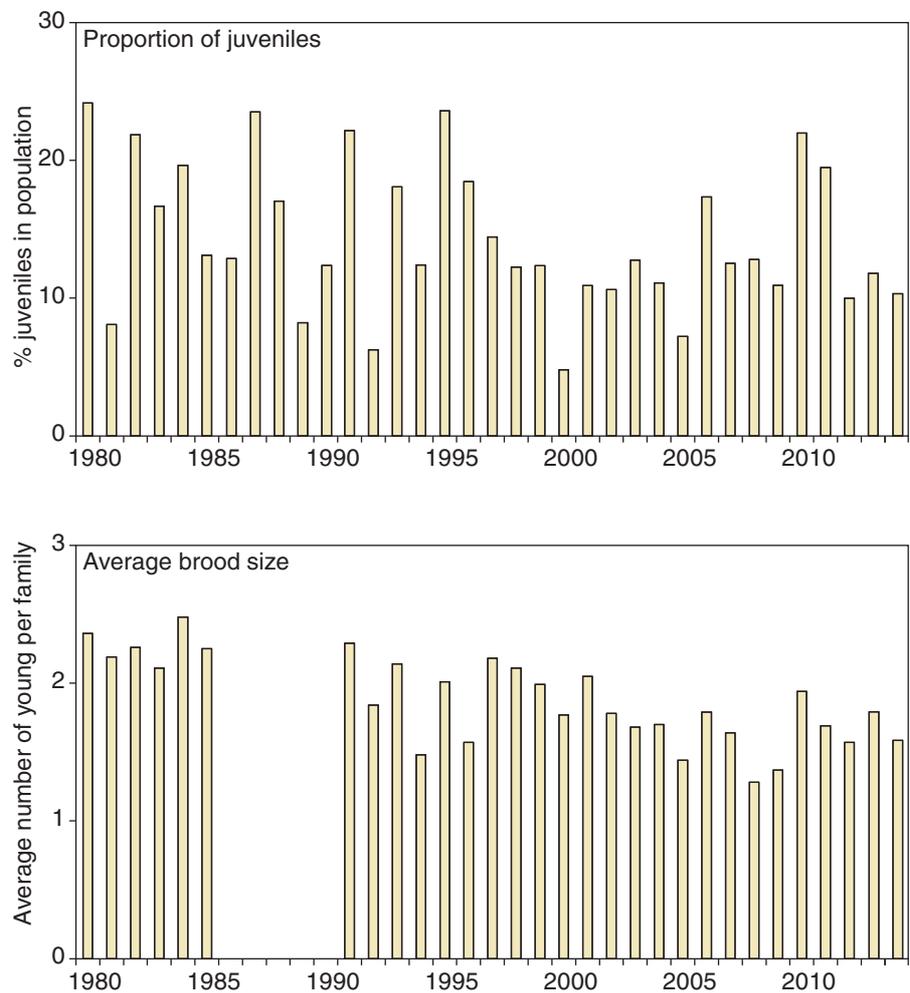


The subsequent productivity in the population of pink-footed geese was recorded in The Netherlands, Denmark and Norway during the autumn of 2014. We used data from 13 October to 4 November to estimate the proportion of juveniles in goose flocks. The proportion varied between 7.6% (in W Jutland, Denmark) and 20.5% (in Norway). This pattern is similar to that found in previous years, with the Norwegian subpopulation having a higher proportion of juveniles. 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 2014 (Table 2). For areas where we have no age counts (Sweden, SW Jutland, Belgium) we have added the numbers to the nearest region with age counts. The overall proportion of juveniles in the population was thus 10.3% which is below the long-term average of 14.4% (1980-2014; Fig. 3).

Table 2. Proportion of juveniles in the population of pink-footed geese in Norway, Denmark and The Netherlands during autumn 2014, 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). Notes: (a) numbers staying in Sweden have been added; (b) numbers staying in SW Jutland have been added; (c) numbers staying in Belgium have been added.

Country	Numbers counted	Number of juvs.	% juvs.	Numbers in early Nov.	Estimated number of juvs.
Norway	713	146	20.5	4339	688
N Jutland, DK	4069	455	11.2	15410 ^(a)	1723
W Jutland, DK	7203	547	7.6	34706 ^(b)	2636
The Netherlands	9858	1204	12.2	19215 ^(c)	2347
TOTAL	23029	2767		73670	7594
				%juvs. weighted	10.3

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.



Brood sizes were recorded in Norway, Denmark and The Netherlands during September-October 2014. Results are summarized in Table 3. There is no significant difference between countries (one-way ANOVA, $p > 0.05$). A pooled estimate is presented, with an average of 1.59 young per family (Table 3). Average brood size has decreased over the long term (Fig. 3); however this figure seems to have stabilised recently.

Table 3. Mean brood sizes (\pm std) recorded in Norway, Denmark, The Netherlands and the total for all countries during autumn 2014. Counts were performed by Paul Shimmings (Norway), Ole Amstrup and Mogens Bak (Denmark) and Fred Cottaar (The Netherlands).

Country	Mean	Sample	std
Norway	1.98	56	0.77
Denmark	1.78	27	0.85
The Netherlands	1.54	523	0.74
TOTAL	1.59	606	0.76

4 Harvest in Norway and Denmark 2014/15

Data on hunting bags from Norway for the autumn 2014/15 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 available until recently, and before 2012 the species distribution was derived via wing collection sampling

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

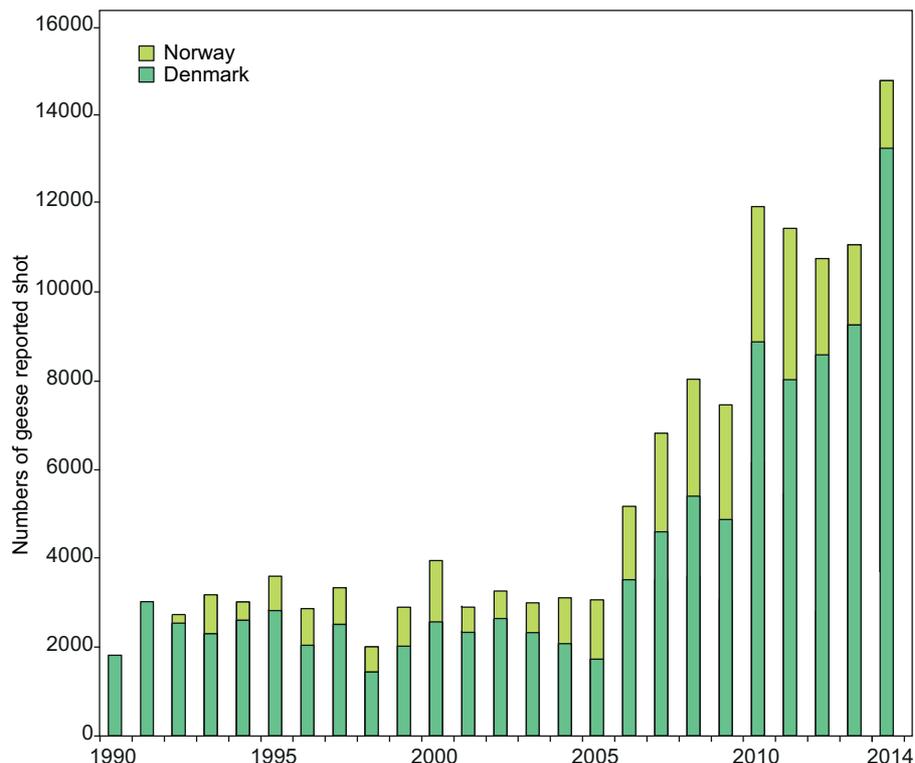
Since 2012, the vast majority of hunters have reported goose hunting bags at species level. Furthermore, the hunting bag reporting scheme has been changed in spring of 2015, resulting in an overall increase in the reporting rate. However, since not all hunters in Norway and Denmark may yet have reported their hunting bags (as of May 2015), the data for 2014/15 is to be regarded as preliminary (Table 4).

Table 4. Hunting bags of pink-footed geese in Norway and Denmark, hunting seasons 2012-2014.

Country	2012	2013	2014
Norway	2169	1819	1594
Denmark	8580	9262	13200
TOTAL	10749	11081	14794

The data shows that in Norway fewer pink-footed geese were shot than in previous hunting seasons (Fig. 4) which seems to be explained by short stopovers in Nord-Trøndelag by the majority of geese (O.M. Gundersen pers. observations).

Figure 4. Harvest of pink-footed geese in Denmark and Norway, 1990-2014. Bag statistics for Norway started in 1992. Data from 2014 are preliminary. Sources: see text.



The numbers of pink-footed geese harvested in Denmark increased by approximately 4000 geese compared to the previous year. In total, the number of harvested geese increased, with a preliminary estimate of c. 14,800 geese reported shot.

In Denmark, the hunting season for pinkfeet was opened on land in January, starting with the hunting season 2014/15. In the three previous hunting seasons, hunting of pinkfeet in January was only allowed on the marine territory. We have analysed the seasonal distribution of the Danish harvest based on the national wing survey as well as of ringed pinkfeet recovered as shot during September 2014 to January 2015. According to the wing survey, pinkfeet were shot throughout the open season from September to end January. However, 47% of wings (n=383) were reported for January 2015 (Fig. 5). During the hunting seasons 2011/12-2013/14, when hunters were allowed to shoot pinkfeet on the marine territory in January, on average 5% of wings were reported for January. Furthermore, the wing survey also shows a seasonal decline in the proportion of first-winter birds shot (Fig. 6).

Figure 5. Seasonal harvest (based on wing surveys, in half-monthly intervals) of pink-footed geese in Denmark 2014/15, when hunting was opened on land in January (n=383). Seasonal average distribution during the previous three hunting seasons (2011/12-2013/14) when hunting of pink-footed geese was only allowed on the marine territory is shown by the red line.

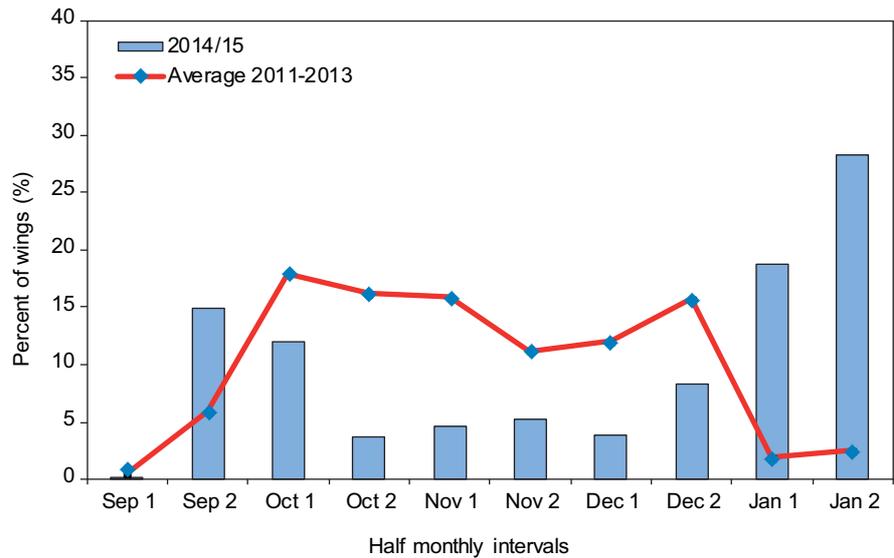
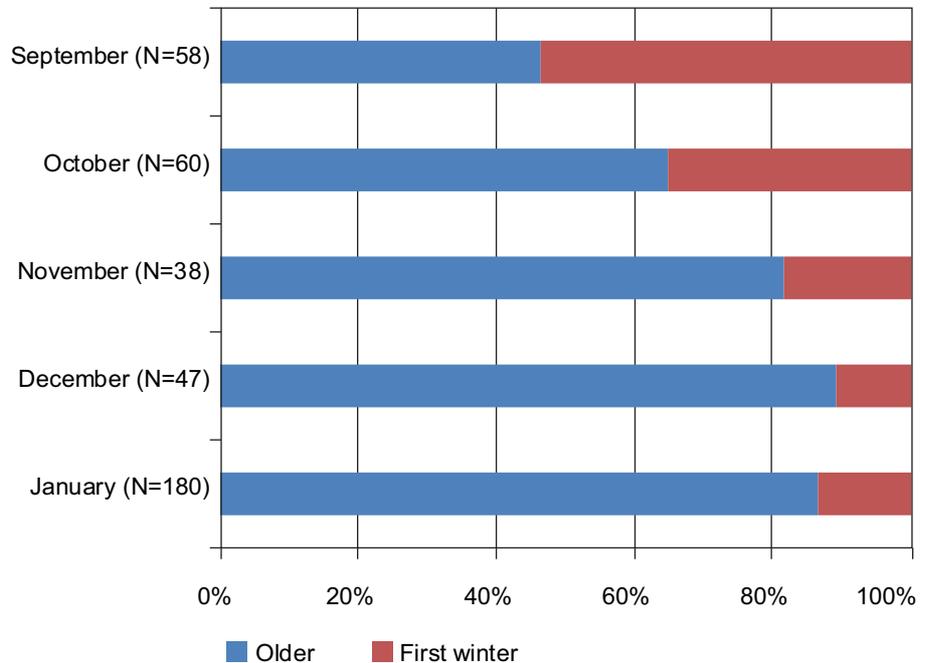


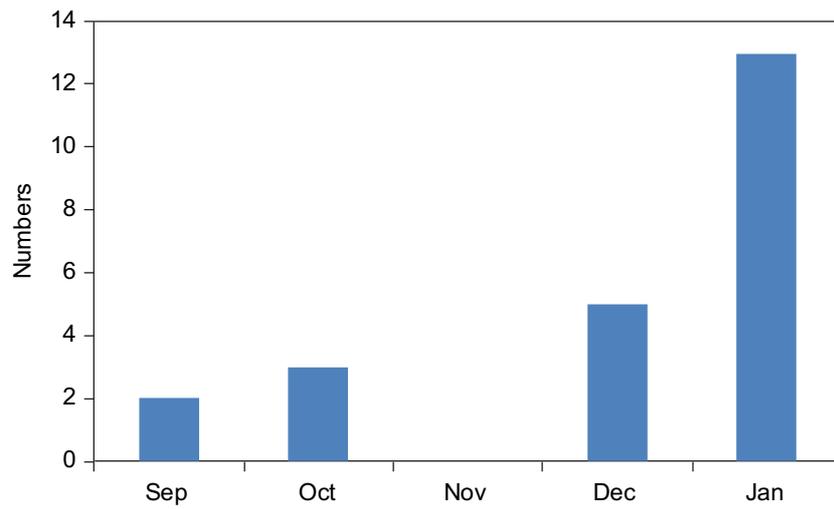
Figure 6. Seasonal age distribution (older versus first-winter birds) of harvest of pink-footed geese in Denmark 2014/15 (in monthly intervals), based on wing surveys. In total 383 wings of pinkfeet were reported.



Pinkfeet have been ringed and neckbanded in Denmark and Svalbard since 1988 as part of a long-term population study. In the hunting season 2014/15, a total of 23 rings were recovered from shot birds, all of which were recovered from Denmark. Out of the 23 rings, 13 were recovered in January 2015 (Fig. 7).

Hence, both the wing survey and ring recoveries provide evidence that the January extension of the hunting season was much used by hunters and this extension was the main reason for the increase in the total harvest in Denmark.

Figure 7. Seasonal distribution of ringed pink-footed geese recovered as shot during the hunting season 2014/15 (n=23; all from Denmark).



As mentioned above, the population estimates from November 2014 and May 2015, respectively, suggest a decline in the population size of c. 14,670 individuals. Based on the seasonal bag composition (Fig. 5), we estimate that in Denmark, c. 9,150 geese were shot after the early November count. We assume that all pinkfeet reported shot in Norway were killed before November. We estimate that monthly natural mortality during winter is 0.6% (Madsen et al. 2002). Assuming that hunting mortality is fully additive to natural mortality, the natural mortality from early November to early May comprises 2600 individuals. Hence, harvest and natural mortality add up to 11,750 individuals. On top, we have an unknown mortality of crippled geese (not retrieved) which die from their wounds before May. In summary, it is not unrealistic that the decline in numbers between November 2014 and May 2015 can be largely explained by the mortality due to hunting and natural causes.

5 Spring weather conditions in Svalbard 2015

For the modelling of optimal harvest strategy for the hunting season 2015/16, 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 2015, Ny Ålesund had 8 thaw days and Svalbard Airport had 10 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 (which has on average resulted in 14% juveniles in the autumn population).

The optimal harvest strategy is reported separately (Johnson & Madsen 2015).

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