# SVALBARD PINK-FOOTED GOOSE

## Population Status Report 2015-2016

Technical Report from DCE – Danish Centre for Environment and Energy No. 82 2016

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Jesper Madsen[1]
Fred Cottaar[2]
Ole Amstrup[3]
Tommy Asferg[1]
Mogens Bak[3]
Johnny Bakken[4]
John Frikke[5]
Vianney Goma[1]
Ove Martin Gundersen[6]
Klaus Günther[7]
Jørgen Peter Kjeldsen[8]
Helmut Kruckenberg[9]
Eckhart Kuijken[10]
Johan Månsson[11]
Per Ivar Nicolaisen[4]
Henrik Haaning Nielsen[12]
Leif Nilsson[13]
Tore Reinsborg[4]
Paul Shimmings[14]
Tapani Tapio[15]
Ingunn Tombre[4]
Christine Verscheure[10]
Pål-Iver Ødegård[4]

[1] Aarhus University, Department of Bioscience
[2]Lutulistraat 42, Haarlem, The Netherlands
[3]Amphi Consult, Denmark
[4]Norwegian Institute for Nature Research, The Fram Centre, Tromsø, Norway
[5]Nationalpark Vadehavet, Rømø, Denmark
[6]Norwegian Farmers' Union, Steinkjer, Norway
[7]Schutzstation Wattenmeer, Husum, Germany
[8]ornit.dk, Denmark
[9]Institute for Wetlands and Waterbird Research e.V., Verden, Germany
[10]Lindeveld 4, Beernem, Belgium
[11]Swedish University of Agricultural Sciences, Grimsö Research Station, Sweden
[12]Avifauna Consult, Denmark
[13]University of Lund, Sweden
[14]BirdLife Norway,
[15]Oulu, Finland

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# Data sheet


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Authors: Jesper Madsen[1], Fred Cottaar[2], Ole Amstrup[3], Tommy Asferg[1], Mogens Bak[3], Johnny Bakken[4], John Frikke[5], Vianney Goma[1], Ove Martin Gundersen[6], Klaus Günther[7], Jørgen Peter Kjeldsen[8], Helmut Kruckenberg[9], Eckhart Kuijken[10], Johan Månsson[11], Per Ivar Nicolaisen[4], Henrik Haaning Nielsen[12], Leif Nilsson[13], Tore Reinsborg[4], Paul Shimmings[14], Tapani Tapio[15], Ingunn Tombre[4], Christine Verscheure[10] & Pål-Iver Ødegård[4]

Institutions: [1]Aarhus University, Department of Bioscience, [2]Lutulistraat 42, Haarlem, The Netherlands, [3]Amphi Consult, Denmark, [4]Norwegian Institute for Nature Research, The Fram Centre, Tromsø, Norway, [5]Nationalpark Vadehavet, Rømø, Denmark [6]Norwegian Farmers' Union, Steinkjer, Norway, [7]Schutzstation Wattenmeer, Husum, Germany, [8]ornit.dk, Denmark, [9]Institute for Wetlands and Waterbird Research e.V., Verden, Germany, [10]Lindeveld 4, Beernem, Belgium, [11]Swedish University of Agricultural Sciences, Grimsö Research Station, Sweden, [12]Avifauna Consult, Denmark, [13]University of Lund, Sweden, [14]BirdLife Norway, [15]Oulu, Finland



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Abstract: This report compiles annual monitoring data on the population status of the Svalbard pink-footed goose for the season 2015-16: 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 (2016-17). 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 2016) was 74,000 individuals, supported by a count of c. 74,800 in early November 2015. This is an increase compared to the year before and strongly suggests that the count in May 2015 was too low. New findings of c. 3,000 pink-footed geese spring staging in the Oulu region in Finland partly explains the reason for the low count. The proportion of juveniles in the population (October 2015) was close to the long-term average, namely 13.8%, in line with predictions based on temperatures in Svalbard in May 2015. The number of pink-footed geese harvested in Norway and Denmark in the 2015 hunting season was c. 11,220, a decline compared to the previous hunting season when hunting was allowed on land in January in Denmark.



Keywords: adaptive management, harvest, pink-footed goose, population monitoring

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# Contents

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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 2015/16. 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 (2016/17). This is part of an adaptive harvest management framework set up to support the implementation of the AEWA International Species Management Plan (ISMP) for the population (see Madsen and Williams 2012; Johnson and Madsen 2013). Data from the previous seasons 2012/13-2014/15 have been published in separate annual reports. Previous reports and further information about the ISMP process can be found on the website for the program: http://pinkfootedgoose.aewa.info/.

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 2015/16

Internationally coordinated population counts were performed on 1 November 2015 and 1 May 2016. Counts were coordinated as closely as possible to these dates. In November, 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 and Germany. Flocks were either counted when they were leaving roost sites in the morning, arriving at roost sites in the evening, or alternatively on fields. For the first time, a coordinated count was organized along the German North Sea coast (Schleswig-Holstein and Lower Saxony). This was done, because in the last couple of years, increasing numbers of pink-footed geese were observed in the Danish part of the Wadden Sea in autumn, and this development is likely to spread further south. On 1 November, there was dense fog in parts of the range (Denmark, Germany, the Netherlands), and counts had to be postponed for some days. 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). Because increasing numbers of pink-footed geese have started to stay in Sweden in autumn and spring, counts have now been organized by local networks in May 2016. From November 2015, goose registrations were available from the online reporting system Svalan (http://svalan.artdata.slu.se/birds) plus via contacts to local counting networks provided by L. Nilsson.

In early April 2016, a neckbanded pink-footed goose was reported to www.geese.org from the Oulu region in western Finland. It turned out that the bird (marked as an adult male in the Levanger area in Nord-Trøndelag on 6 May 2015) had migrated from north Jutland, Denmark in late March to the Tysslingen area, Sweden in the start of April, and onwards to western Finland, where it was sighted for nearly a month until start of May (Fig. 1). A contact was made to the Finnish observer (T. Tapio), who kindly, together with a team of local birdwatchers, organized a count of pink-footed geese in the Oulu region on 1 May.

The population counts are summarized in Table 1. In early November 2015, a total of 74,830 geese were counted, with the majority (69.4%) staging in Denmark, followed by Norway (12.1%), Flanders in Belgium (7.8%), The Netherlands (7.6%) and Sweden (2.9%). Less than 100 were observed in Germany. The tendency from the previous years is thus sustained; in Denmark, flocks were observed all along the west coast, with 34% in the Wadden Sea. In Norway, the majority was counted in Nord-Trøndelag (65%), but flocks of up to 1000 individuals were observed in Hedmark and flocks >100 spread over several sites in southern Norway. Hence, there is a trend for shortstopping along the Norwegian migration corridor south of Nord-Trøndelag.

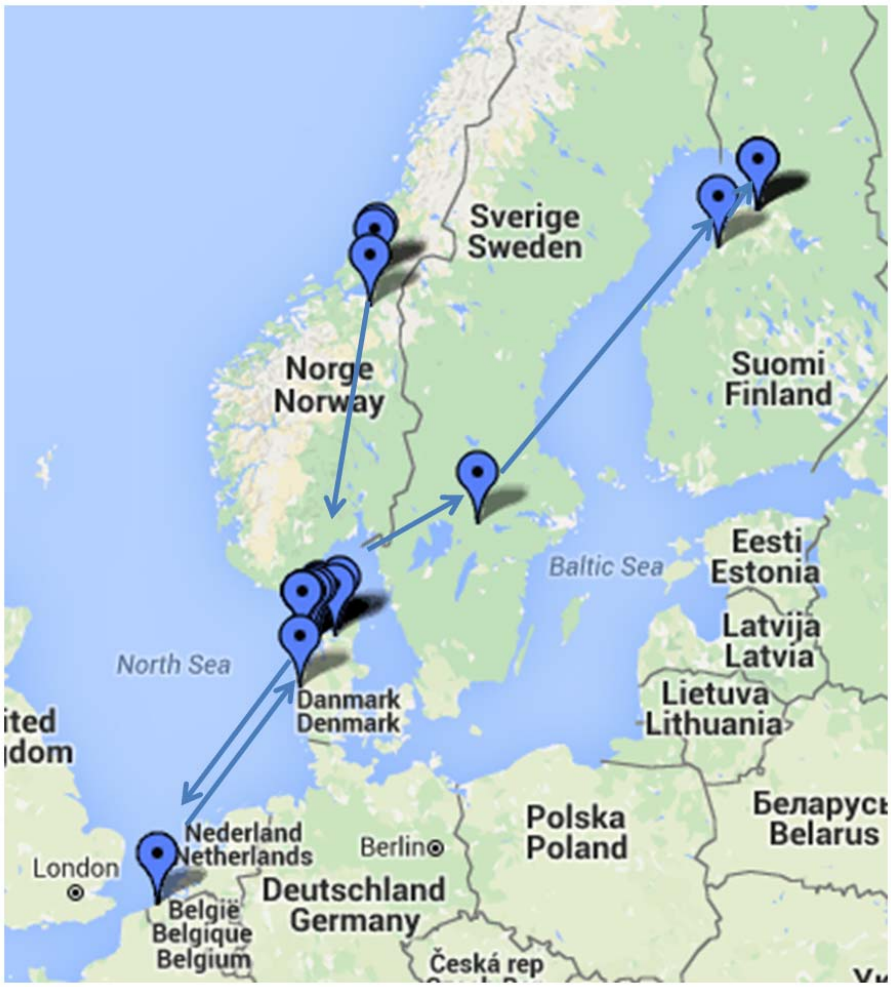



**Figure 1.** Migration route followed by a neck-banded pink-footed goose (white V40) autumn 2015-spring 2016. The bird was ringed in Mid-Norway on 6th May 2015. Arrows show the sightings made during autumn 2015 and spring 2016. It was last sighted in the Oulu area on 3 May 2016. The subsequent spring migration route of Finnish staging pink-footed geese remains unknown.

In the start of May 2016, a total of 74,000 individuals were counted, distributed in Trøndelag in Norway (94.4%), followed by Finland (4.1%), Denmark (1.1%) and Sweden (0.5%). In Norway, 98% of the geese were found in Nord-Trøndelag.

In summary, the population estimate for the spring of 2016 is 74,000 geese. The numbers counted in November 2015 gave a similar result; This may suggest that the autumn 2015 estimate is too low (because we know that there was hunting and natural mortality in the interim period); foggy weather in early November 2015 caused problems, and particularly in the Danish Wadden Sea, flocks may have been missed. However, the counts show that the population estimate of spring 2015 (59,000) was definitely too low. This was already communicated to the range states in late autumn 2015 (see: http://pinkfootedgoose.aewa.info/node/195/). According to T. Tapio, numbers of pink-footed geese in the Oulu region has increased rapidly in recent years, and this may account for at least some of the bias in spring 2015. Furthermore, in May 2016, flocks of pink-footed geese were observed in the Namsos area and the eastern end of Snåsavatnet in Nord-Trøndelag; these areas were not counted in spring 2015.

**Table 1.** Results of synchronized counts of pink-footed geese in autumn 2015 and spring 2016.

| Country | Region | Numbers | |
|---|---|---|---|
| | | 1 Nov. 2015 | 1 May 2016 |
| Norway | Nord-Trøndelag | 5869 | 68327 |
| | Vesterålen | 0 | 705 |
| | Other sites | 3213 | 833 |
| Denmark | N Jutland | 15565 | 670 |
| | W Jutland | 18490 | 133 |
| | SW Jutland | 17890 | 0 |
| Finland | Oulu region | 0 | 3000 |
| Sweden | Various sites | 2189 | 340 |
| Germany | Schleswig-Holstein | 90 | 0 |
| | Lower Saxony | 2 | 0 |
| Netherlands | Friesland | 5500 | 0 |
| | Midden-Delfland | 180 | 0 |
| Belgium | Flanders | 5842 | 0 |
| TOTAL | | 74830 | 74008 |

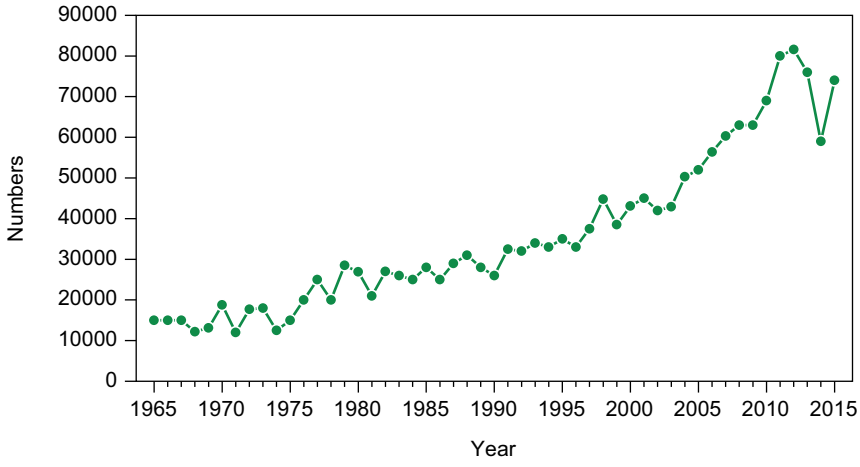



**Figure 2.** Development of the size of the Svalbard pink-footed goose population, 1965/66-2015/16.

# 3 Productivity autumn 2015

The overall productivity of the 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 quantified from satellite images 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 2015, Ny Ålesund had 8 thaw days and Svalbard Airport had 10 thaw days, hence an average of 9 thaw days, slightly above the long-term average for 1990-2014, which is 7.8 (Fig. 3). We predicted that this would result in an average production of young in 2015 (14%).

The subsequent productivity in the population of pink-footed geese was recorded during the autumn of 2015 in Norway, Denmark, The Netherlands and Belgium. We used data from 13 October to 4 November to estimate the proportion of juveniles in goose flocks. The proportion varied between 11.7% (in Denmark) and 21.8% (in Norway). This pattern is similar to that found in previous years, with the Norwegian flocks having a higher proportion of juveniles, i.e. more families staying there. To derive an overall estimate, the proportion of juveniles has been weighted against the approximate number of geese staying in Norway, Denmark, The Netherlands and Belgium, respectively, during late October/early November 2014 (Table 2). For areas where we have no age counts (Sweden, Germany) we have added the numbers to the nearest region with age counts. The overall weighed proportion of juveniles in the population was thus 13.8% which is very close to the prediction (Fig. 4).

**Table 2.** Age counts in the population of pink-footed geese in Norway, Denmark and The Netherlands during autumn 2015, and an estimate of the overall population-wide proportion of juveniles, weighed on basis of the approximate late October/early November distribution of numbers between countries. Numbers staying in Sweden have been added to Denmark and numbers staying in Germany have been added to The Netherlands. Counts were performed by Paul Shimmings (Norway), Ole Amstrup, Jørgen Peter Kjeldsen, Mogens Bak (Denmark), Fred Cottaar (The Netherlands) and Christine Verscheure and Eckhart Kuijken (Belgium).

| Country | Sample size | Number of juvs in sample | % juvs. | Numbers staging in early Nov. | Estimated overall number of juvs. |
|---|---|---|---|---|---|
| Norway | 2108 | 459 | 21.8 | 9082 | 1978 |
| Denmark | 11885 | 1396 | 11.7 | 54134 | 6359 |
| The Netherlands | 4728 | 746 | 15.8 | 5772 | 911 |
| Flanders, Belgium | 1793 | 334 | 18.6 | 5842 | 1088 |
| TOTAL | 18721 | 2601 | | 74830 | 10335 |
| | | | | %juvs. weighted | 13.8 |

Brood sizes were recorded in Norway, Denmark and The Netherlands during September-October 2015. Results are summarized in Table 3. There is a significant difference between countries (one-way ANOVA with Tukey post-hoc test, $F = 20.33$, $df = 2$, $p < 0.001$; Norway higher than Denmark and Netherlands and Denmark higher than Netherlands). A pooled estimate is presented, with an average of 1.78 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 (± std) recorded in Norway, Denmark, The Netherlands and the total for all countries during autumn 2015. Counts were performed by Paul Shimmings (Norway), Ole Amstrup, Mogens Bak and Jørgen Peter Kjeldsen (Denmark) and Fred Cottaar (The Netherlands).

| Country | Mean | Sample | std |
|---|---|---|---|
| Norway | 2.23 | 102 | 1.35 |
| Denmark | 1.85 | 299 | 0.97 |
| The Netherlands | 1.54 | 268 | 0.76 |
| TOTAL | 1.78 | 669 | 0.99 |

**Figure 3.** Number of days with average daily temperatures in May in Svalbard as a proxy for the spring conditions for breeding, 1990-2016. 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.

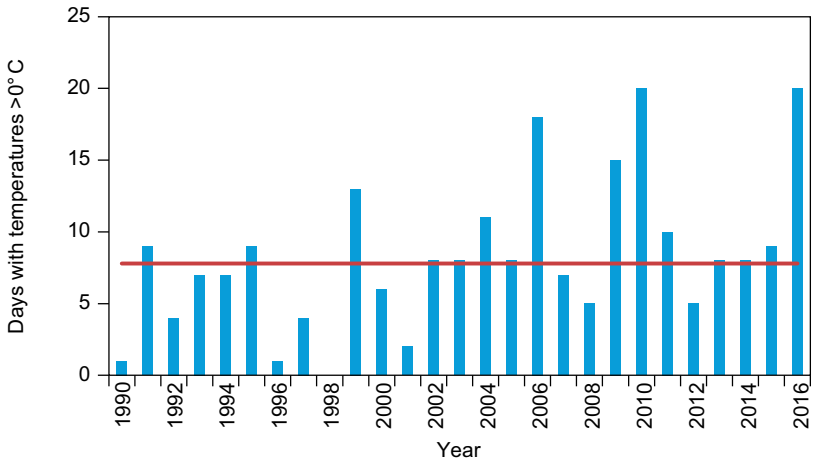
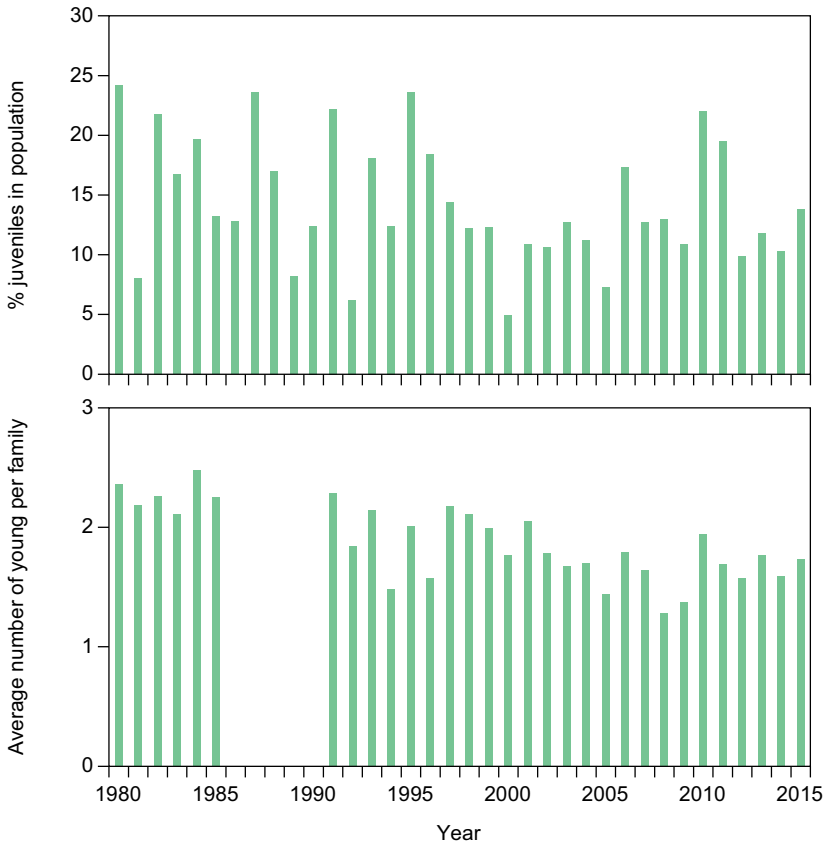



**Figure 4.** Productivity in the population of pink-footed geese, expressed by the proportion of juveniles in the population in autumn and average brood size, 1980-2015.



# 4 Harvest in Norway and Denmark 2015/16

Following the optimal harvest strategy for the hunting season 2015/16 (Johnson and Madsen 2015), the harvest of pink-footed geese had to be restricted (due to the population decline observed in May 2015). Accordingly, it was recommended to adjust the total harvest to 6,700 geese to ensure that the population would not fall below the target of 60,000 in spring 2016. Following the recommendation by the International Working Group of the ISMP, Denmark and Norway shall share the total harvest by a 70:30 ratio, i.e. c. 4,700 geese to Denmark and 2,000 geese to Norway in 2015/16. To accommodate for the reduction in harvest, the Danish Minister for Environment and Food (based on recommendation from the Nature Agency and the National Wildlife Management Council) decided to reduce the length of the hunting season, closing hunting of pink-footed geese in January (which had been introduced in the previous season). In Norway, there was a plan to introduce an annual quota system based on daily reporting by hunters shooting pink-footed geese. However, the system was not yet fully set-up for the hunting season.

Data on hunting bags from Norway for the autumn 2015 has been supplied by Statistics Norway (www.ssb.no) (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 2016), the data for 2015/16 is still preliminary (Table 4).

In Norway, a total of 2,640 pink-footed geese were reported shot, mainly from Nord-Trøndelag. This is higher than in previous years (Table 4, Fig. 5) which can be explained by the extended staging period in Norway.

The numbers of pink-footed geese reported shot in Denmark was 8,761. This is lower than in the year before, when hunting was allowed in January (Table 4). In total, the number of harvested geese was 11,221, which is lower than in 2014, but at the same level as in 2012 and 2013.

**Table 4.** Hunting bags of pink-footed geese in Norway and Denmark, hunting seasons 2012-2015.

| Country | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|
| Norway | 2169 | 1819 | 1594 | 2460 |
| Denmark | 8580 | 9262 | 13200 | 8761 |
| TOTAL | 10749 | 11081 | 14794 | 11221 |

The numbers harvested are well above the recommended 6,700, primarily due to Danish hunters shooting more than expected (4,700). It should be borne in mind; however, that the recommended quota was based on a spring population estimate of 59,000, and it is likely that the population was in reality around 70,000. The reduction of the hunting season with January was expected to lead to a c. 50% reduction of the harvest in Denmark (Madsen et al. 2016). If the spring 2015 population had been at c. 70,000, the Danish quota (without January harvest) would have been at roughly 6,000. Hence, Danish hunters still shot more than expected. This may have to do with the fact that adjusting hunting season length as a tool to regulate harvest is not necessarily linear, but is sensitive to several factors. Firstly, a large proportion of the population remained in Denmark throughout September-December, leading to a higher hunting exposure. This has been the trend in the last five years (Madsen et al. 2015), and was reinforced in 2015. Secondly, we do not know if hunters adjusted their hunting behaviour to go out shooting more frequently in the shorter hunting season. Thirdly, from interviews and studies in both Norway (Jensen et al. 2016) and Denmark (Madsen et al. in prep.) we know that goose hunters are increasing their efficiency by more targeted shooting using blinds in the fields, decoys and calls, and they increasingly hunt in teams, i.e. shooting more geese per hunting event.

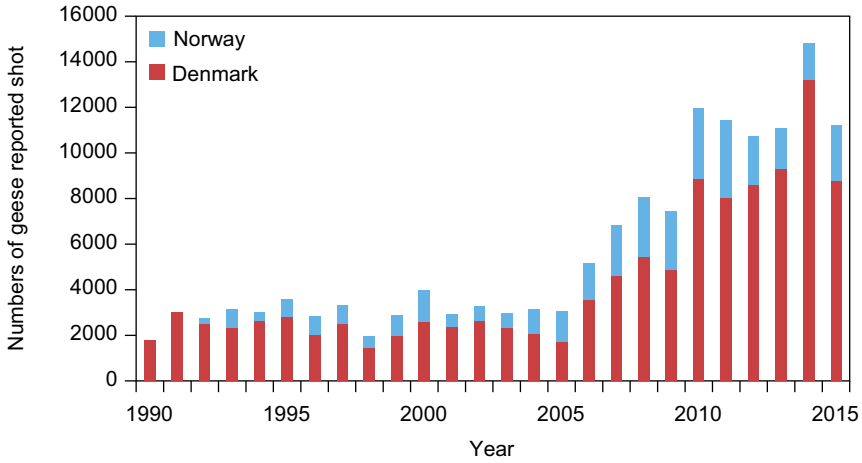



**Figure 5.** Harvest of pink-footed geese in Denmark and Norway, 1990-2015. Bag statistics for Norway started in 1992. Sources: see text.

# 5 Spring weather conditions in Svalbard 2016

For the modelling of optimal harvest strategy for the hunting season 2016/17, 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 2016, Ny Ålesund had 17 thaw days and Svalbard Airport had 22 thaw days. For further analysis an average of 20 thaw days will be used which is way above the long-term average for 1990-2015, of 7.8 (see Fig. 2). Hence, we predict a breeding season to be above 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 2016).

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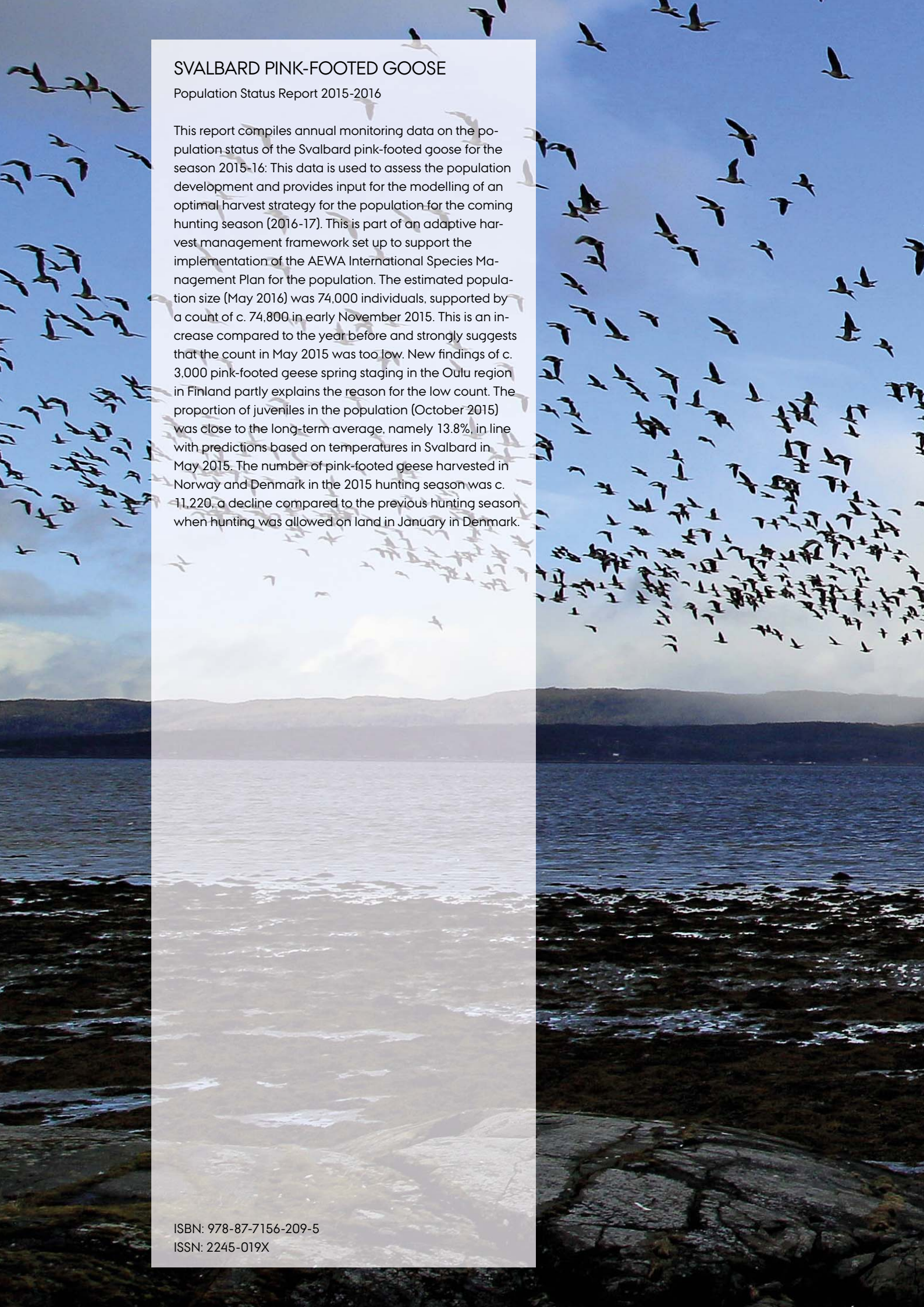

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