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Staging and wintering Taiga Bean Geese *Anser fabalis fabalis* in north-east Scania, south Sweden

Rastande och övervintrande taigasädgäss Anser fabalis fabalis *i Nordostskåne*

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Abstract

In the municipalities of Bromölla and Kristianstad, south Sweden, monthly counts of Bean Geese have been carried out during October–March/April since November 1976. The seasonal peak count was up to 1987/1988 recorded in March, during the following six seasons in January, and from 1994/1995 onwards in November or December. April numbers decreased from more than 5000 birds in 1977 to hardly any at all from 1997 onwards. Fewer Bean Geese were counted up to the 1986/1987 season than thereafter. In most of the last 25 seasons, the number of Taiga Bean Geese *Anser fabalis fabalis* in north-east Scania peaked at about 20% of the total Western Palearctic population, with a highest count of 24 000 birds in December 1997. Most or all Bean Geese left north-east Scania during severe winters. Checks of staging bean goose flocks and hunting bags showed that, except for Lake Hammarsjön from 2004/2005 onwards and a few flocks in the other areas, the Tundra Bean Goose *Anser serrirostris rossicus* was quite rare in the region.

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Introduction

The breeding range of the Taiga Bean Goose *Anser fabalis fabalis* stretches from Scandinavia to the lower Ob region, western Siberia (Alphéraky 1905, Nilsson et al. 1999). It breeds in the forest zone, in areas with a mixture of different types of mire, mire forest, ponds and small lakes. High breeding densities have been found in the aapa mire zone (Pirkola & Kalinainen 1984).

The majority of all Taiga Been Geese stages in Sweden in late autumn (Nilsson 2013a), and winters in south Sweden and Denmark (Nilsson et al. 1999), with small numbers in Scotland and Norfolk (Mitchell et al. 2010). Staging areas of birds migrating on a route south of the Baltic Sea are less well known (Kampe-Persson 2010a). That part of the population winters in north-east Germany and north-west Poland (Heinicke 2004, Heinicke et al. 2005), with small numbers in the Netherlands and Belgium (Nilsson et al. 1999, Koffijberg et al. 2011). There are also small numbers of Taiga Bean Geese wintering in central Asia (Heinicke 2009).

Taiga Bean Geese use different migration routes to their winter quarters (Söderberg 1917, Jägerskiöld & Kolthoff 1926). Large efforts to map these migration routes have been undertaken but little is known of where birds from different parts of the breeding range stage and winter. Birds fitted with GPS tags in Scotland revealed a spring migration route through North Jutland and Oslo to breeding grounds in the Swedish province of Dalarna (http://scotlandsbeangeese.wikispaces.com). The vast majority of birds neck-collared at a moulting site in the southern part of Swedish Lapland were re-sighted staging in both autumn and spring in north-west Jutland and wintering in Norfolk (Parslow-Otsu 1991, Parslow-Otsu & Kjeldsen 1992). Birds fitted with satellite transmitters during spring staging in northern Sweden were followed to breeding grounds in northernmost Sweden, Finnmark in Norway and Karelia in Russia, as well as to moulting grounds on Novaja Zemlja (Nilsson et al. 2010). Neck-collared individuals from these spring staging areas were in winter re-sighted at the Swedish west coast, in North Jutland and in Scania (Skyllberg et al. 2009a). Birds ringed at moulting sites in north Norway were recovered, most of them hunted, along the west coast of Finland and at haunts in south Sweden and Denmark (Tveit

1984). Finnish Taiga Bean Geese mainly winter in south Sweden (Nilsson 2011) and to a lesser extent in Denmark, Germany and the Netherlands (Saurola et al. 2013). Recoveries of birds ringed in the Netherlands revealed migration routes to partly northern Fennoscandia and partly the west Siberian lowland (Burgers et al. 1991). Re-sightings of birds neck-collared in Germany indicated that most Taiga Bean Geese wintering in Germany and Poland use a migration route south of the Baltic Sea (Heinicke 2010).

The Taiga Bean Goose is listed as Near Threatened in the Swedish Red List (Tjernberg et al. 2010) and qualifies to be red-listed also internationally. The population wintering in the Western Palearctic declined from 100 000 birds in the 1990s to 63 000 birds in the season 2008/2009 (Nilsson et al. 1999, Fox et al. 2010). The wintering population in central Asia has been estimated at 2000–5000 birds (Heinicke 2009). Whether the population decline is caused by factors acting during the breeding (Mellquist & von Bothmer 1982, Filchagov et al. 1985, Kampe-Persson et al. 2005) or the non-breeding season (Huyskens 1999) is not known. Also unknown is when the decline started and whether all parts of the breeding range have been affected. The Swedish breeding range, for instance, was markedly reduced already between 1922 and 1969 (Mellquist & von Bothmer 1982).

The lack of explanation to the recorded population declines is due to difficulties to study this taxon. Taiga Bean Geese breed in remote areas and are experts of concealment. They can be hard to find also during the non-breeding season (Parslow-Otsu & Kjeldsen 1992, Kampe-Persson 2010a, b). A factor that has caused large problems for more than a century is misidentification. During the non-breeding season, the Taiga Bean Goose regularly occurs together with other bean goose taxa, of which the Tundra Bean Goose *Anser serrirostris rossicus* is the most numerous. In this contribution, Taiga Bean Goose and Tundra Bean Goose were treated as species (Naumann 1842, Van Impe 1980a, b, Sangster & Oreel 1996, Sangster et al. 1999, 2003, Banks et al. 2007, Mitchell & Vinicombe 2012). As the taxonomy differs among countries, the Taiga Bean Goose and the Tundra Bean Goose are as a rule referred to as *fabalis* and *rossicus*, respectively. Also Middendorff's Bean Goose *Anser* (*fabalis*) *middendorffii* and the Thick-billed Bean Goose *Anser serrirostris serrirostris* have been reported from north-west Europe (van den Bergh 2003b, 2004).

Based on material from Mecklenburg and Brandenburg it was stated that the majority of all Bean Geese were made up of hybrids between *fabalis* and *rossicus* (Litzbarski 1974, Cramp 1977, Ogilvie 1978, Klafs & Stübs 1979, Owen 1980, Rutschke 1983, 1987, Liebherr & Rutschke 1993). This conclusion was the result of a typological way of looking at the birds; all individuals that differed from the "type individual" were regarded as belonging to a mixed population. In reality, there is large individual variation, especially in size, shape and colouration of the bill, in both *fabalis* and *rossicus* (see e.g. Liebherr & Rutschke 1993). Despite the fact that *fabalis* and *rossicus* often occur in mixed flocks, mixed pairs of these taxa are rare (Kampe-Persson & Lerner 2007, Leo van den Bergh in litt., Thomas Heinicke pers. comm.) and hybrids of supposedly wild origin are limited to one bird observed in north-east Scania (Kampe-Persson & Lerner 2007, and unpubl.). Due to misidentification there is a lack of data about the number of staging and wintering Taiga Bean Geese in Germany before the early 1990s. In Sweden, counters have usually not separated Taiga and Tundra Bean Geese but reported them all as "sädgäss" ("bean geese"). For that reason, Bean Goose in Swedish reports (Nilsson 2000) has been denoted as "a *fabalis* population mixed with small numbers of *rossicus* and a few occasional *middendorfi* and *serrirostris*." Up to about ten years ago the total number of staging Tundra Bean Geese in Sweden only occasionally exceeded 1000 individuals but the taxon has become more numerous since then (Persson 1990, 1997b, Kampe-Persson 2011, Heinicke & de Jong 2013).

Many changes in the non-breeding distribution of geese have been described in the last decades. One major pattern is referred to as "short-stopping". This term is used when southerly areas are deserted by birds as conditions closer to the breeding grounds become favourable. This phenomenon has been reported for several goose species (Mathiasson 1963, Kear 1965, Reeves et al. 1968, Dzubin et al. 1975, Owen 1980, Persson & Urdiales 1995, Kampe-Persson 2002). The changes in bean goose occurrence in north-east Scania described in this contribution will partly be interpreted as "short-stopping".

Long-term monitoring in a region of importance during the non-breeding season can give valuable information for the conservation of a species. The more if the counts have covered the entire non-breeding season and the actual region is situated at a crucial part of the species' non-breeding range. The aim of this contribution was to document the monthly counts of Bean Geese undertaken in

north-east Scania from November 1976 to December 2013 and to put these counts, as well as counts carried out during the years 1947–1976, into a historical, ecological and international context.

Study area

The study area comprises the two municipalities Bromölla and Kristianstad, and a small area in the municipalities Hässleholm and Östra Göinge as well, north-east Scania, south Sweden (Figure 1). The main soil type is sand, the area is situated south of the January −1.0ºC isotherm and the annual precipitation ranges from 500 mm at the coast to 600 mm inland, of which 10–20% comes as snow (Germundsson & Schlyter 1999). One third of the total land area is used for agriculture. The main crops are (percentage of total cultivated area in 2012): cereals (36%), grasses (29%), potatoes (9%), sugar beet (7%), vegetables (6%), oilseed rape (4%) and maize (2%) (http://statistik.sjv.se). All fields are situated within normal flight distances of a night roost (Persson 1989). The shallow coast between Landön and Tosteberga, River Helgeå, and the Lakes Ivösjön, Oppmannasjön, Råbelövsjön, Gummastorpasjön, Araslövsjön, Hammarsjön, Pulken and Yngsjösjön have been used for roosting (Mathiasson 1963, Swegen 1963, Hakon Kampe-Persson pers. obs.). The coastal roost was, at least earlier, also used by Taiga Been Geese feeding at Vesan in the westernmost part of the province of Blekinge (Nilsson & Persson 1984). River Helgeå, the largest river in the study area, flows or flowed through Lakes Gummastorpasjön, Araslövsjön, Hammarsjön, Pulken, Yngsjösjön and Egeside.

Also other geese than the bean geese spend the non-breeding season in north-east Scania (Kampe-Persson et al. 2007, www.spoven.com). Most counts of Canada Geese *Branta canadensis* in the months October–March during the period 1976/1977–2013/– ranged between 1500 and 10 000 birds but numbers were higher from the 1999/2000 season onwards than before. The Greylag Goose *Anser anser* occurred in quite low numbers up to 1990/1991. Numbers increased during the 1990s and from 2001 counts often exceeded 10 000 in September and October, from 2005 also in November. The occurrence during the winter months fluctuated greatly depending on the severity of the winter, with a maximum count of 7000 birds in February 2008. Since 2003, about 6000 birds were often counted in March. In 1993, the number of Barnacle Geese *Branta leucopsis* in October and November started to increase. From 2000 onwards, numbers counted in October and November often exceeded 5000 birds, increasing to more than 26 000 in November 2013. Occasionally, up to 7000 Barnacle Geese were found in September and up to 12 000 in December. The White-fronted Goose *Anser albifrons* has been more numerous from 1995 onwards than previously but numbers have rarely exceeded 1000 birds.

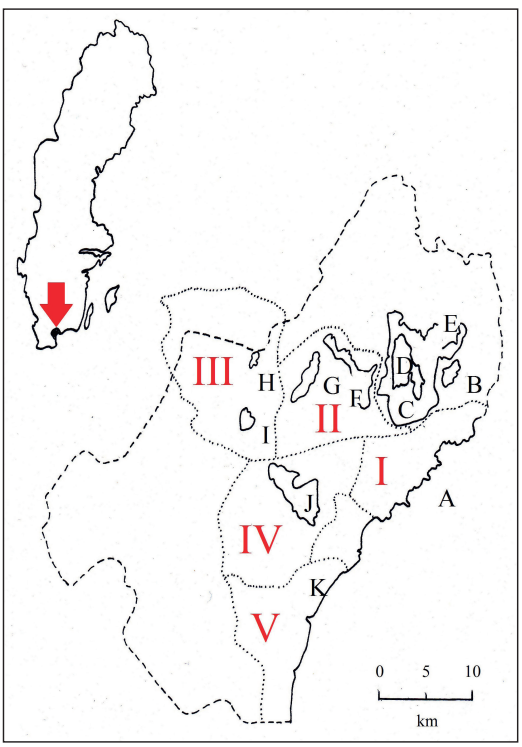

Figure 1. Map of the study area. Depicted are the land border of the municipalities Bromölla and Kristianstad (broken line), shorelines (unbroken line) and borders of the five main census areas (stippled line); I. Trolle-Ljungby, II. Oppmannasjön + Råbelövsjön, III. Araslövsjön + Gummastorpasjön, IV. Hammarsjön and V. Egeside. A = coastal roost between Landön and Tosteberga, B = Lake Levrasjön, C = Lake Ivösjön, D = Ivö, E = Näsum, F = Lake Oppmannasjön, G = Lake Råbelövsjön, H = Lake Gummastorpasjön, I = Lake Araslövsjön, J = Lake Hammarsjön and K = Egeside.

Karta över undersökningsområdet. Markerat är landgränsen för kommunerna Bromölla och Kristianstad (streckad linje), strandlinjer (heldragen linje) samt gränserna för de fem huvudsakliga inventeringssområdena (prickad linje); I. Trolle-Ljungby, II. Oppmannasjön + Råbelövsjön, III. Araslövsjön + Gummastorpasjön, IV. Hammarsjön och V. Egeside. A = nattplats längs kusten mellan Landön och Tosteberga, B = Levrasjön, C = Ivösjön, D = Ivö, E = Näsum, F = Oppmannasjön, G = Råbelövsjön, H = Gummastorpasjön, I = Araslövsjön, J = Hammarsjön och K = Egeside.

Material and methods

Goose counts 1976/1977–2013/-

The part of the study area used by geese during the non-breeding season was divided into five census areas (Neideman & Svensson 1976, Figure 1): Trolle-Ljungby, Oppmannasjön + Råbelövsjön, Araslövsjön + Gummastorpasjön, Hammarsjön and Egeside. Later, two sites at Lake Ivösjön were added: Näsum from October 2003 and Ivö from December 2006. At Lake Levrasjön geese were counted within the framework of mid-monthly waterfowl counts but no Taiga Bean Geese were encountered (Persson & Persson 1992, and unpubl.). The division into census areas was based upon well-defined borders, usually larger roads. By that, doubts were avoided regarding who should count the geese in each flock.

With some exceptions given below, counts were undertaken by members of the local bird-watching society, Nordöstra Skånes Fågelklubb, every month during the period October–April. In addition, September counts were carried out in 1977 and from 1993 onwards. Only three complete counts were carried out in 1976/1977 and 1978/1979, but another three counts were undertaken in some of the census areas during the last-mentioned season. Due to blizzards with snowed-up roads, only some of the census areas could be checked in February 1978 and no area at all in December 2012. Due to advancement of the pre-nuptial migration, and therefore no geese present, there have been no counts in April since 2004.

The counts were undertaken Saturday morning during the week-end closest to the 15th. The majority of all geese were counted more or less simultaneously while seeking food in the fields. All individuals of all goose species were counted. Taiga Bean Geese and Tundra Bean Geese were not differentiated but reported as Bean Geese.

The counted numbers should be regarded as minimum numbers, especially during the first seasons, before the observers learned the counting technique. Problems during the counts were caused by rain, wind (January 2007 and March 2007), mist (February 2005, November 2007 and December 2007) and hunting (October 2003, November 2006 and November 2009). Due to these problems, some geese were not found by the observers, while others were reported as unidentified. Up to 90 unidentified geese were noted on 19 occasions, 17 of these before the 1990/1991 season, while more than 100 unidentified were noted on five occasions; 336 in October 1977, 536 in October 1984, 516 in December 1986, 303 in January 1999 and 1100 in February 2004 (Kampe-Persson 2007).

Proportions of Taiga Bean Goose and Tundra Bean Goose

To obtain estimates of the proportion of Taiga Bean Geese among the staging and wintering bean geese, three sets of data were used: field checks in 1976–2013 by the author, Georges Huyskens, Leo van den Bergh, Thomas Heinicke, Frank Abrahamson, Greger Flyckt and Sven Birkedal, checks of hunting bags at Trolle-Ljungby Manor, and observations of staging flocks of Tundra Bean Geese numbering at least 50 birds. Huyskens, van den Bergh, Heinicke and Abrahamson checked the bean geese in the five main census areas, Flyckt at Egeside, Birkedal at Trolle-Ljungby, and the author mainly at Trolle-Ljungby and Oppmannasjön. No checks were undertaken at Hammarsjön and Egeside during the seasons 2004/2005–2008/2009 and no checks at all at Ivösjön.

Results

Goose counts 1976/1977–2013/-

Both temporal and numerical changes took place in north-east Scania during the period 1976/1977–2013/– (Table 1). Numbers of Bean Geese in April decreased from more than 5000 birds at the first count to hardly any at all from 1997 onwards. A similar change, though on a smaller scale, might have taken place in the autumn, because 389 birds were counted in September 1977 (Svensson 1977), the only September count undertaken before 1993. The seasonal peak count was up to the 1987/1988 season recorded in March, during the following six seasons in January and from the 1994/1995 season onwards in November or December. In general, fewer Bean Geese were counted up to the 1986/1987 season than thereafter. Count figures exceeding 22 000 birds were recorded five times during the period 1991/1992–2004/2005 and the highest count was of 24 064 birds in December 1997. Most or all Bean Geese left north-east Scania during severe winters.

Except for Egeside and Ivösjön the different census areas showed about the same temporal and numerical changes as the entire area (Appedix 1–6). In general, Trolle-Ljungby was the area housing most staging and wintering Bean Geese, the seasonal peak count often exceeding 10 000 birds, reaching 15 802 in November 2003 (Appendix 1). Oppmannasjön + Råbelövsjön showed the largest among-year variation in both occurrence pattern and numbers (Appendix 2). In most seasons during

Table 1. Number of Bean Geese recorded at mid-monthly counts in the municipalities of Bromölla and Kristianstad, 1976/1977–2013/–. A bar (–) indicates that no complete count was carried out that month.
Antalet sädgäss inräknade vid mittmånads-inventeringar i Bromölla och Kristianstad kommuner säsongerna 1976/1977–2013/–. Minustecken (–) anger att ingen komplett inventering genomfördes den månaden.

	October	November	December	January	February	March	April
76/77	–	3 567	–	609	–	5 807	–
77/78	1 855	5 500	4 981	7 919	–	11 140	5 641
78/79	1 906	–	–	728	–	6 617	–
79/80	825	5 061	3 628	2 036	1	5 244	–
80/81	956	5 300	2 075	3 822	5 047	5 374	3 487
81/82	2 036	4 781	1 925	0	69	17 345	6 448
82/83	1 016	4 943	8 200	6 747	1 648	13 462	3 517
83/84	770	5 434	2 032	9 407	4 901	10 958	4 831
84/85	1 909	3 881	11 849	1 461	887	8 280	5 369
85/86	295	5 118	3 361	269	633	6 761	4 238
86/87	674	3 358	7 975	0	186	1 442	1 761
87/88	247	3 013	12 763	8 288	14 344	17 767	1 314
88/89	31	7 110	12 021	19 960	9 694	1 379	839
89/90	372	1 977	7 804	16 359	13 107	628	480
90/91	342	10 581	17 703	16 913	4 968	1 611	275
91/92	5	10 397	13 644	23 874	16 564	836	507
92/93	762	15 310	12 319	16 099	15 385	4 694	192
93/94	786	10 181	9 456	14 213	8 802	7 115	377
94/95	810	17 518	18 366	17 222	12 727	695	101
95/96	248	9 415	12 636	523	7 630	13 541	224
96/97	201	14 510	18 693	3 106	8 460	515	59
97/98	930	19 933	24 064	16 390	8 627	1 766	7
98/99	8	16 086	13 635	10 171	6 034	2 081	0
99/00	2 300	13 201	16 810	13 918	6 320	389	1
00/01	40	4 186	11 178	15 637	13 657	578	0
01/02	35	18 223	14 512	3 762	11 234	53	0
02/03	711	20 793	22 274	8 387	7 598	333	64
03/04	3	23 752	15 099	10 326	6 813	4 572	–
04/05	243	23 381	14 818	10 256	9 685	8 582	–
05/06	217	3 753	17 633	7 765	8 540	4 127	–
06/07	866	18 329	13 835	8 802	9 867	90	–
07/08	511	16 156	15 862	14 846	8 831	138	–
08/09	0	6 066	12 034	11 715	11 483	286	–
09/10	441	6 829	15 173	7 291	4 162	9 380	–
10/11	2 446	12 636	5 631	533	2 247	8 753	–
11/12	1 372	13 143	12 999	9 980	5 176	153	–
12/13	20	4 593	–	7 387	7 278	17 159	–
13/14	122	3 756	19 402	–	–	–	–

the entire survey period, the seasonal peak count was in the range 2000–2500 birds at Araslövsjön + Gummastorpasjön (Appendix 3) and around 5000 birds at Hammarsjön (Appendix 4). Egeside, on the other hand, was a typical wintering and spring staging area with few Bean Geese in autumn, often no birds at all in October (Appendix 5). A similar timing of the occurrence was reported for the Egeside area in the period 1970–1976 (Månsson 1977). The seasonal peak count usually fell in the range 2500–4000 birds during the period 1987/1988–2005/2006, lower before and after that period. The Bean Geese at Ivösjön were counted too few seasons to discern any patterns (Appendix 6).

Proportions of Taiga Bean Goose and Tundra Bean Goose

Field checks of 1000 or more bean geese were realised in a total of 45 months during the period 1976/1977–2013/– (Table 2). The proportion of Taiga Bean Geese during these checks was 100%

Table 2. Percentage of the staging and wintering bean geese in the municipalities of Bromölla and Kristianstad that was made up of Taiga Bean Geese *Anser fabalis fabalis*, 1976/1977–2013/–. No checks were undertaken in the census areas Hammarsjön and Egeside during the seasons 2004/2005–2008/2009. The census area Hammarsjön was excluded from the 2009/2010 season onwards. Data are given for months when at least 1000 bean geese were checked (sample sizes in brackets). For the remaining months, a bar indicates that no complete mid-monthly count was carried out or that fewer than 1000 bean geese were found. Sources other than the author: October 1983 and November 1984 (Huyskens 1986); December 1986, October 1993, October 1994 and October 2003 (Leo van den Bergh in litt.); February 2012, March 2013 and November 2013 (reports on http://svalan.artdata.slu.se/birds); December 2013 (Evert Valfridsson in litt., reports on http://svalan.artdata.slu.se/birds).
P*rocentandelen av de rastande och övervintrande sädgässen i Bromölla och Kristianstad kommuner som utgjordes av taigasädgäss* Anser fabalis fabalis *säsongerna 1976/1977–2013/–. Inga kontroller företogs inom räkningsområdena Hammarsjön och Egeside under säsongerna 2004/2005–2008/2009. Räkningsområdet Hammarsjön exkluderades från och med säsongen 2009/2010. Resultat ges för de månader då mer än 1000 sädgäss kontrollerades (antalet kontrollerade sädgäss anges inom parentes). För övriga månader anger ett minustecken att ingen komplett mittmånadsinventering genomfördes eller att färre än 1 000 sädgäss hittades. Källor andra än författaren: oktober 1983 och november 1984 (Huyskens 1986); december 1986, oktober 1993, oktober 1994 och oktober 2003 (Leo van den Bergh i brev); februari 2012, mars 2013 och november 2013 (rapporter på http://svalan.artdata.slu.se/birds); december 2013 (Evert Valfridsson i brev, rapporter på http://svalan.artdata.slu.se/birds).*

	October	November	December	January	February	March
76/77	99.5 (1 256)	99.7 (2 010)	–	–	–	
77/78	100 (1 500)	100 (6 500)			–	100 (1 909)
78/79		–	100 (2 618)	–	–	
79/80	–				–	
80/81	–	100 (2 230)	100 (1 090)			
81/82				–	–	
82/83			100 (2 500)	100 (1 750)	100 (1 364)	
83/84	100 (2 176)	100 (4 310)	100 (2 501)	100 (2 550)		100 (3 875)
84/85		100 (3 000)	100 (1 730)	100 (2 750)	100 (1 050)	
85/86	–			–	–	
86/87	100 (1 011)	100 (2 200)	100 (4 417)	–	–	
87/88	–					
88/89	–					
89/90	–					–
90/91	–					
91/92	–					–
92/93	100 (1 050)					
93/94	99.9 (8 007)					
94/95	96.8 (3 077)					–
95/96	–			–		
96/97	99.4 (3 520)	99.9 (12 715)				–
97/98	–					
98/99	–	99.8 (10 519)				
99/00	99.8 (6 410)		99.8 (6 813)			–
00/01	–					–
01/02	–					–
02/03	–					–
03/04	98.1 (2 818)					
04/05	–		100 (3 498)			
05/06	–					
06/07	–		99.9 (7 800)			–
07/08	–		99.9 (7 500)			–
08/09	–					–
09/10	–			99.9 (4 884)		
10/11		98.8 (6 201)				
11/12		98.8 (6 578)		100 (7 970)	99.4 (2 424)	
12/13	–	99.6 (2 489)	–	100 (1 626)		100 (4 196)
13/14	–	99.9 (4 146)	99.1 (6 213)			

Table 3. Staging flocks of Tundra Bean Goose *Anser serrirostris rossicus* numbering at least 50 individuals in the municipalities of Bromölla and Kristianstad, up to 2013.
Rastande flockar av tundrasädgås Anser serrirostris rossicus *i Bromölla och Kristianstad kommuner fram till och med 2013 som uppgått till minst 50 individ.*

	No. *Antal*	Site *Lokal*	Source/observer *Källa/observatör*
14 April 1974	60	Tosteberga	Hakon Kampe-Persson
14 February 1975	>50	Trolle-Ljungby	Hakon Kampe-Persson
18 October 1975	250	Trolle-Ljungby	Persson 1990
2 November 1975	100–300	Trolle-Ljungby	Hakon Kampe-Persson
27 October 1994	85	Trolle-Ljungby	Leo van den Bergh in litt.
11 January 2003	95	Hovby	Flyckt et al. 2004
9 March 2003	580	Vanneberga	Flyckt et al. 2004
29 February 2004	70	Yngsjö	Bernsmo et al. 2005
13 March 2004	120	Trolle-Ljungby	Bernsmo et al. 2005
2–11 February 2006	65	Trolle-Ljungby	Bernsmo et al. 2007
5 November 2006	200	Tosteberga	Bernsmo et al. 2007
3–4 February 2007	50	Yngsjö	Bernsmo et al. 2008
6 December 2009	90	Vanneberga	Karlsson et al. 2010
4 January 2010	55	Tosteberga	Bernsmo et al. 2011
12 November 2010	72	Östra Ljungby	Hakon Kampe-Persson
Mid November 2010	5 042	Hammarsjön	Thomas Heinicke
12 February 2011	85	Hovby	Bernsmo et al. 2012
12 February 2011	50	Hovby	Bernsmo et al. 2012
12 November 2011	54	Hovby	Frank Abrahamson
14 January 2012	350	Hovby	Frank Abrahamson
14 January 2012	1 100	Norra Åsum	Frank Abrahamson
Mid January 2012	4 988	Hammarsjön	Thomas Heinicke
4 February 2012	235	Gärds Köpinge	Frank Abrahamson
2 March 2013	210	Hovby	Frank Abrahamson
2 March 2013	256	Svaneholm	Frank Abrahamson
2 March 2013	450	Mosslunda	Frank Abrahamson
9 March 2013	71	Hovby	Frank Abrahamson
9 March 2013	111	Gärds Köpinge	Frank Abrahamson
16 March 2013	309	Gärds Köpinge	Frank Abrahamson
23 March 2013	420	Horna	Frank Abrahamson
23 March 2013	200	Hovby	Frank Abrahamson
23 March 2013	1900	Hovby	Frank Abrahamson
17 November 2013	300	Hovby ängar	Frank Abrahamson
23 November 2013	90	Gärds Köpinge	Greger Flyckt
30 November 2013	620	Hovby	Frank Abrahamson
8 December 2013	100	Yngsjö	Greger Flyckt
8 December 2013	460	Egeside	Greger Flyckt
15 December 2013	4 489	Vittskövle	Frank Abrahamson
22 December 2013	1 100	Vittskövle	Greger Flyckt

27 times, 99.1–99.9% 14 times and 96.8–98.8% four times. Of bean geese hunted and taxonomically checked at Trolle-Ljungby Manor during the years 1976–2012, 99.9% (N=2043) were Taiga Bean Geese. Flocks numbering 50 or more Tundra Bean Geese were reported 39 times in the study area up to 2013 (Table 3). All but five of these observations were made during the years 2003–2013. Flocks numbering more than 1000 Tundra Bean Geese were only recorded in the census area Hammarsjön during the last four seasons of the survey period. In the fields around Lake Hammarsjön, up to 5000 Tundra Bean Geese but very few Taiga Bean Geese were found in the seasons 2010/2011–2013/– (Table 3, reports on http://svalan.artdata.slu.se/birds). In meadows along the shores of this lake however, especially in Rinkaby ängar and Hovby ängar, flocks of up to 415 Taiga Bean Geese were recorded between mid-January and mid-March in the seasons 2010/2011–2012/2013 (reports on http://svalan.artdata.slu.se/birds).

Discussion

Both Taiga and Tundra Bean Geese occur in north-east Scania but undoubtedly, the vast majority of the birds counted were Taiga Bean Geese. However, to be able to interpret the overall picture, I start by discussing the much rarer Tundra Bean Goose.

Tundra Bean Goose

During the last decade, increasing numbers of Tundra Bean Geese have started to winter in Denmark (Pihl & Vikstrøm 2006, Stefan Pihl unpubl.) and at Lake Hammarsjön (Heinicke & de Jong 2013). As no field checks were carried out at Lake Hammarsjön in the seasons 2004/2005–2008/2009, it is not known when the Tundra Bean Goose started to use that area for staging and wintering. The fact that 4988 birds were counted in January 2012 compared to none a year earlier should not be regarded as the start of wintering however, as it merely reflects the severity of the winter. Few Tundra Bean Geese remain in north-east Scania in severe winters (Heinicke & de Jong 2013). The Tundra Bean Geese found at Lake Hammarsjön very likely originated from the westernmost part of the breeding range (van den Bergh 1999, Aarvak & Øien 2009). Birds neck-collared in northernmost Norway from 2003

Table 4. Number of Bean Geese recorded during counts in the municipalities of Bromölla and Kristianstad before the 1976/1977 season. Besides five complete counts, results are given for one count covering two areas and 23 single area counts. Count data provided by the author and Huyskens (1986) refer to Taiga Bean Geese.
Antalet sädgäss inräknade vid inventeringar i Bromölla och Kristianstad kommuner före säsongen 1976/1977. Utöver fem kompletta inventeringar ges resultat från en inventaring omfattade två områden och 23 inventeringar omfattande vardera ett område. Inventeringssiffror givna av författaren och Huyskens (1986) avser taigasädgäss.

	No. *Antal*	Area(s) *Område(n)*	Source/observer *Källa/observatör*
18 May 1950	300	Araslövsjön	Mathiasson 1963
22 January 1951	210	Hammarsjön	Mathiasson 1963
25 May 1952	300	Araslövsjön	Mathiasson 1963
4 December 1955	1 000	Araslövsjön	Mathiasson 1963
5 May 1956	20–25	Hammarsjön	Mathiasson 1963
9–15 November 1956	2 000	Araslövsjön + Hammarsjön	Mathiasson 1963
2 May 1958	100	Hammarsjön	Mathiasson 1963
17 November 1958	3 000	Araslövsjön	Mathiasson 1963
1 December 1958	1 000	Hammarsjön	Mathiasson 1963
1 March 1959	10 000	North-east Scania	Mathiasson 1963
7–8 March 1959	3 855	North-east Scania	Mathiasson 1963
5 April 1959	945	North-east Scania	Mathiasson 1963
10 October 1959	3 000	Hammarsjön	Mathiasson 1963
30 October 1960	>1920	Araslövsjön	Jensen et al. 1962
30 October 1960	630	Hammarsjön	Jensen et al. 1962
5 March 1961	3 000	Egeside	Swegen 1963
27 October 1973	2 000	Trolle-Ljungby	Hakon Kampe-Persson
17 November 1973	2 000	Trolle-Ljungby	Hakon Kampe-Persson
16 February 1974	1 000	Trolle-Ljungby	Hakon Kampe-Persson
17–19 October 1974	800	North-east Scania	Huyskens 1986
2–3 November 1974	450	Trolle-Ljungby	Hakon Kampe-Persson
29–31 December 1974	1 500	Trolle-Ljungby	Hakon Kampe-Persson
14 February 1975	1 150	Trolle-Ljungby	Hakon Kampe-Persson
12 April 1975	575	Trolle-Ljungby	Hakon Kampe-Persson
26 April 1975	200	Trolle-Ljungby	Hakon Kampe-Persson
9 November 1975	2 488	Trolle-Ljungby	Hakon Kampe-Persson
11–14 November 1975	4 500	North-east Scania	Huyskens 1986
2 January 1976	>2935	Trolle-Ljungby	Hakon Kampe-Persson
8–25 January 1976	1 505	Trolle-Ljungby	Hakon Kampe-Persson
8 February 1976	1 664	Trolle-Ljungby	Hakon Kampe-Persson

onwards have in late autumn and winter mainly been reported from north-east Scania (de Jong et al. 2013). A migration route from northern Fennoscandia through staging areas in north-east Scania to winter quarters in east Germany was indicated in an earlier neck-collaring project (Persson 1997a). Wintering was reported from the Trolle-Ljungby area in the winter 1974/1975 (Persson 1995). The 95 birds observed at Hovby in January 2003 (Table 4) were maybe also wintering.

The establishment of the Tundra Bean Goose as a staging and wintering bird at Lake Hammarsjön shows that areas situated close to each other can develop very differently. Lake Hammarsjön was, in fact, one of a few goose areas in Scania that were not regularly checked for the occurrence of Tundra Bean Geese during the years of establishment (Kampe-Persson 2011, this study). This calls upon awareness of patchy distributions when mapping goose areas (Kampe-Persson 2013b).

Short-stopping

To follow the short-stopping process at a locality is like viewing the entire flyway during a season. From the north to the south you find in the ideal case a sequence of areas used in different ways: not at all, for staging only, for both staging and wintering, only for wintering, for wintering but in declining numbers and only in the past. Data from Lake Hammarsjön shows an almost complete cycle, as that area was not used by Taiga Bean Geese before 1947 (Nordquist 1947a) and only by low numbers during late winter/early spring nowadays (this study).

A northward shift in the distribution during the non-breeding season has been recorded in the Taiga Bean Goose since the mid 20th century (Mathiasson 1963, Nilsson 2013a). The proportion of the total number of Bean Geese counted in October that was found north of Scania increased from 14% in 1960 (Mathiasson 1963) to 100% in 2012 (Nilsson 2013b). During the same period of time, the area holding the largest number of birds in October shifted northwards, first from south-west Scania to Lake Tåkern (50 000 birds in 1988) and then to the province of Närke (35 000 birds in 2001) (Nilsson 2013a). About 1500–3000 birds wintered in south-west Scania and none in the rest of the country during the years 1947–1960 (Mathiasson 1963). Later, the wintering area was extended to include also north-east Scania but the species is only sometimes found north of Scania in January (Nilsson 2013a). Few spring counts are available. The centre of distribution in March was south-west Scania during counts in 1977–1980 (Nilsson & Persson 1984) but the province of Uppland in 2007 (Skyllberg & Tjernberg 2008). At Umeå, the peak count was about 3–4 weeks earlier in the springs 2003–2008 (Skyllberg et al. 2009b) compared to in 1977–1980 (Nilsson & Persson 1984).

The occurrence of Taiga Bean Geese in north-east Scania since the mid 1940s gives an excellent example of short-stopping as it covers also the phase before the birds started to winter. In the 1950s, this region was only used for staging in autumn and spring of birds that wintered in south-west Scania, Denmark, Germany and Netherlands (Nilsson 1984). Large acreages of autumn-sown crops and milder winters gradually made it possible for the geese to winter in north-east Scania. However, the severity of the winter, primarily the thickness of the snow-cover on the feeding grounds, determined how many geese that actually could remain the entire winter. Often, heavy snowfall forced the geese to move southwards/south-westwards for shorter or longer periods of time. At the same time as conditions for wintering improved in north-east Scania conditions for staging, especially in spring, improved further north. To be able to match the phenology of their main food plants along their migratory pathways (Drent 1996, Drent et al. 2006, Nilsson 2006, Tombre et al. 2008) the geese started to initiate their pre-nuptial migration from this region earlier and earlier. The last phase in the on-going process would be for the geese to choose winter quarters closer to their breeding grounds. Lower numbers of Taiga Bean Geese in north-east Scania during the last decade compared to the decade before might be a step to complete disappearance from the region. However, lower numbers might also be related to an overall population decline.

Also the Tundra Bean Goose has gone through a period of short-stopping since the 1940s, during which the Spanish wintering population vanished (Persson & Urdiales 1995). Instead, they started to spend the winter in Germany and the Netherlands (van den Bergh 1999). A new shift started a decade ago (Pihl & Vikstrøm 2006, this study). Up to 9200 Tundra Bean Geese were found staging in South Sweden, especially at the Lakes Kvismaren, Östen and Tåkern, in October in the years 2009–2011 (Heinicke & de Jong 2013). In November, during mild winters also in January, up to 5000 Tundra Bean Geese were recorded at Lake Hammarsjön during the same period of time (Heinicke & de Jong 2013). Regular staging of Tundra Bean

Geese in autumn is a new phenomenon in South Sweden. During field checks of feeding bean geese at all main staging areas for Bean Geese in South Sweden in October 2003, a total of 38 648 Taiga Bean Geese but only 106 Tundra Bean Geese were recorded (Leo van den Bergh in litt.). Of these Tundra Bean Geese, ten were found at the four aforementioned lakes.

Range changes in autumn and winter can be brought about in a short period of time (Owen 1980). The Tundra Bean Goose is not the only recent example of such a change in South Sweden. The total number of Barnacle Geese counted during mid-monthly counts in Sweden had up to 1999 never exceeded 5000 birds (Nilsson 2000). In November 2000, more than 55 000 Barnacles were counted (Nilsson 2001). Since then, the counted numbers have remained on a high level, with peak counts of 201 000 birds in south Sweden in November 2012 (Nilsson 2013a), of 132 000 in south-west Scania in October 2012 (Kampe-Persson 2013a) and of 26 000 in north-east Scania in November 2013 (www.spoven.com).

Milder winters in south Sweden may lead to further re-distributions of the goose populations. The Tundra Bean Goose might replace the Taiga Bean Goose as the most numerous wintering goose species in north-east Scania. Also the Pink-footed Goose may become more numerous, partly as a response to the implementation of the management plan for the Svalbard population (Madsen & Williams 2012). In either case, there are good reasons to continue the monitoring of staging and wintering geese.

Taiga Bean Goose

Except for the census area Hammarsjön during the last decade and a few staging flocks in the other areas, the Tundra Bean Goose has been quite rare in north-east Scania (Persson 1990, 1995, this study). Therefore, with the exception of the census area Hammarsjön during the last decade, there are good reasons to accept the count data for Bean Goose as good representatives of the true numbers of Taiga Bean Geese.

North-east Scania is beyond dispute an area of international importance for staging and wintering Taiga Bean Geese. In most of the last 25 seasons, the number of Taiga Bean Geese in north-east Scania peaked at about 20% of the total Western Palearctic population. Except for Hammarsjön from 2004/2005 onwards, each of the five main census areas regularly housed more than one percent of the world population, Trolle-Ljungby often 10–19 percent, during the same period of time.

While changes in the overall distribution during the non-breeding season were brought about by short-stopping, the local and regional occurrence patterns depended on a set of factors. The main requirements of a goose during the non-breeding season are a safe night roost and suitable feeding grounds situated not too far from the roost (Owen 1980). North-east Scania is well provided with suitable roosts, with many lakes and a shallow coast, partly rich in low uninhabited islands. Food choice of the Taiga Bean Goose has been studied in Scania since the mid-1940s (Nordquist 1947b, Markgren 1963, Mellquist & Nilsson 1968, Persson 1982, 1989, Nilsson & Persson 1984, 1991, 2000, Nilsson & Kampe-Persson 2013). In the light of these studies, it is possible to follow how north-east Scania developed into a region of international importance for the Taiga Bean Goose.

Natural grasslands and fields of clover were the main feeding habitats for Taiga Bean Geese in both autumn and winter before the 1960s (Markgren 1963). In spring, natural grasslands were and still are the preferred feeding habitat (Markgren 1963, Persson 1982, 1989). Large extensions of grasslands along River Helgeå offer a plausible explanation to the importance of the area for staging geese in the 1950s and also to why the numbers were larger in spring than in autumn (Mathiasson 1963, Table 4). In the Trolle-Ljungby area, on the other hand, the acreage of natural grasslands was quite low and very few Taiga Bean Geese staged there up to the early 1960s (Mathiasson 1963). No bean geese at all were recorded in this area in the years 1841–1866 (Wallengren 1849, 1853, 1866, Gadamer 1852, 1853).

Taiga Bean Geese used agricultural fields in Scania for feeding already two centuries ago (Nilsson 1835). However, it was the mechanisation of the agriculture during the post-war period (Myrdal & Morell 2011) that made farmland feeding possible on a larger scale. Mechanical harvesting of potatoes and sugar beet leaves large amounts of spill for the geese to exploit (Persson 1982, 1989, Nilsson & Persson 1984, 1991, 2000, Nilsson & Kampe-Persson 2013). Such spill made it possible for the Taiga Bean Goose to start using the Trolle-Ljungby area for staging in the 1960s or early 1970s (Table 4). With a rich food supply and a safe night roost nearby, the Trolle-Ljungby area developed into a staging and wintering area for large numbers of Taiga Bean Geese.

Hunting has been singled out as the factor during

the non-breeding season having the largest negative impact on Taiga Bean Geese from both the western and eastern part of the breeding range (Huyskens 1999). Relevant data about hunting bags and other effects of hunting are scanty however. Besides killing birds hunting can have a negative impact by injuring birds, dissolving pair bonds and other social units, causing birds to desert a haunt completely (Ogilvie 1968), increasing the amount of time spent in flight or in alert positions and making birds keep larger distances to humans, cars and sites where hunters might hide (Karlsson et al. 1978). The latter factor significantly reduces the area available for feeding, sometimes forcing geese to leave an area altogether. Disturbance caused by hunting as well as interruption of pair bonds can significantly reduce the number of fledged young produced during the following breeding season (Persson 1999, Nilsson & Persson 2001). In north-east Scania, the hunting pressure seems to have been quite low but information is only available from Trolle-Ljungby Manor, an entailed estate in the Trolle-Ljungby area, comprising about 12 000 ha.

During the years when the open season was restricted to the first three weeks of November (1960–1991), bean geese were usually hunted during only two days in this large estate. Later, when the length of the open season had been extended to three months (October–December), hunting was reduced to one day a year (New Year's Eve). As only geese landing at pre-dug holes in agricultural fields were shot at, scared birds could search refuge at the night roost. There, they could wait undisturbed until the hunting stopped at 11 a.m. That a majority of the Taiga Bean Geese can leave an area altogether during the first hunting day was observed in other parts of Scania (Nilsson & Persson 1978). Hunters that did not follow the local ethical rules, designed to keep the number of injured birds at a minimum, were not invited to future goose hunting parties at Trolle-Ljungby Manor (Lars Liljenberg pers. comm.). Among Taiga Bean Geese shot with a rifle in south-west Scania, mainly after the closure of the open seasons of 1978 and 1979, 28% of the first calendar-year birds and 62% of the older birds carried 1–12 lead pellets in their tissues (Jönsson et al. 1985). So, in spite of the fact that often quite large numbers of geese were bagged during a hunting day in the Trolle-Ljungby area, the geese remained in the area.

Inter-specific competition may occur among feeding geese. Several spring staging sites in Norway that earlier were used by Pink-footed Geese are nowadays used by Barnacle Geese (Ingunn Tombre pers. comm.). The Pink-footed Geese are excluded from these sites as the Barnacle Geese graze the vegetation too short for the Pink-footed Geese to feed on. Shortly after that a mixed flock has landed in a field, all Pink-footed Geese are found at the edge of the flock. Also in Scania, where often up to six or seven species feed in the same field in autumn and winter, it is normal to find the different species separated from each other. When the species occur in low numbers, such a separation can be due to "sub-flocking", that closely related individuals stay together (Raveling 1969, Rutschke 1982, Nilsson & Persson 1992). Another explanation has to be sought when the species occur in large numbers. One suggestion is that each species avoid species with higher pecking and pacing rates (Madsen 1985). This avoidance may also be related to how dense the feeding flocks are, because fast-feeding species keep a shorter inter-individual distance than slow-feeding species (pers. obs.). The Taiga Bean Geese are, in either case, at a disadvantage as they have lower pecking and pacing rates and keep a longer inter-individual distance than Barnacle Geese, White-fronted Geese, Pink-footed Geese and Tundra Bean Geese (pers. obs).

However, for inter-specific competition to be present, food should be limiting. Food supplies are nowadays usually superabundant during the non-breeding season but there might be two annual bottlenecks. First, when the harvested fields are depleted or ploughed. Later, when all fields with winter cereals have been grazed. Due to population increases among staging and wintering geese in north-east Scania during the last decades, November 2013 and December 2013 were the two months with the largest counted totals so far (www.spoven.com), inter-specific competition may be an important factor in the observed distribution patterns.

Food depletion is the most plausible reason for the progressively earlier seasonal peak counts in north-east Scania, due to the increasing overall food intake from increasing goose numbers. Each switch of the seasonal peak count to an earlier month coincided with a marked increase in the total number of Bean Geese counted in the first months of the season. Also numbers of other goose species staging and wintering in north-east Scania have increased markedly since the mid-1990s (Kampe-Persson et al. 2007, www.spoven.com), all species feeding on the same food sources (Nilsson & Kampe-Persson 2013). Apparently, when the energy-rich food (harvest spill) was depleted, some of the geese moved on southwards/south-westwards, while the others switched to less profitable food sources (fields with

winter cereal). As long as Taiga Bean Geese have access to fields with winter cereal and experience little disturbance, the geese are not in want. Frequent exposure to disturbance might, however, force the birds to leave the haunt as they no longer can balance their energy budget (Persson 1989).

Another factor reducing the availability of the felds for feeding geese are actions taken by farmers to keep them away from growing crops. It was after the agricultural revolution in the 18th and 19th centuries, that farmers started to scare the geese away from their fields to alleviate crop damage. In north-central Spain, the villages employed boys, so called *ganseros*, to keep the geese from the autumn-sown crops (Madoz 1849). In 2004, north-east Scania got its own *gansero*. Under the auspices of a regional management plan (Edberg 2004), this person has since the 2004/2005 season helped the farmers to scare the Greylag Geese away from sensitive crops. However, as all goose species use the very same food sources during the non-breeding season, often in mixed flocks (Nilsson & Kampe-Persson 2013), all species are affected even if only one of them is actively scared. So, the disappearance of the Taiga Bean Goose from cultivated fields at Lake Hammarsjön and a decline in the numbers of staging and especially wintering Taiga Bean Geese in north-east Scania since 2004 might be more than a coincidence.

In the 1990s, the number of wintering Greylag Geese increased in the Netherlands at the same time as the number declined in south-west Spain. Birds followed all-year-round showed that these numerical changes were due to birds wintering in the Netherlands had higher survival and higher breeding output, at the same time as they recruited into the breeding population at an earlier age (Nilsson & Persson 1996). Corresponding data are lacking for Taiga Bean Geese wintering in north-east Scania. In fact, even the origin of the birds is poorly known. A number of individuals neck-collared at breeding grounds in Finland have been re-sighted here (Nilsson 2011) and in January, low numbers of large-sized birds with large, mainly black bills, strongly indicating an eastern origin (van den Bergh 2003a) often were observed (Hakon Kampe-Persson unpubl.). Whether or not the majority of the unmarked birds originated from the same areas as the marked ones is unknown. Uncertainty regarding origin of the birds makes it impossible to determine if the Taiga Bean Geese that wintered at Lake Hammarsjön switched to another wintering area or if that part of the population has markedly declined in number.

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Sammanfattning

Här redovisas de månatliga inventeringar av sädgäss som medlemmar av Nordöstra Skånes Fågelklubb genomfört under ickehäckningstid i Nordostskåne (kommunerna Bromölla och Kristianstad, samt ett mindre område i kommunerna Östra Göinge och Hässleholm) sedan november 1976. Målet var att sätta in dessa resultat i ett historiskt, ekologiskt och internationellt sammanhang. Av den anledningen redovisas även samtliga kända inventeringar från åren 1947–1976, dels av området som helhet och dels av enskilda gåsområden (Tabell 4).

Inventeringarna genomfördes månaderna oktober-mars/april på lördag förmiddag under den helg som inföll närmast den 15:e. Före den första inventeringen delades regionen in i fem räkningsområden, vilka förblivit oförändrade. Ett sjätte räkningsområde med två lokaler har tillkommit, Näsum från och med oktober 2003 och Ivö från och med december 2006. Antalet inräknade gäss bör ses som absoluta minimisiffror, ty otjänlig väderlek och jakt medförde emellanåt att gäss blev oräknade eller oidentifierade.

Eftersom inventerarna inte skiljt på taigasädgäss (skogssädgäss) och tundrasädgäss samlades information om andelen taigasädgäss i flockarna in genom separata kontroller av rastande flockar, genomgång av jaktbyten på Trolle-Ljungby Gods samt uppgifter om flockar på minst 50 tundrasädgäss (Tabell 2 och 3). Sammantaget visade dessa uppgifter att bortsett från räkningsområde Hammarsjön från och med säsongen 2004/05 och några rastande flockar i övriga räkningsområden har tundrasädgåsen förekommit sparsamt i Nordostskåne. Med undantag för Hammarsjön från och med 2004/05 kan de inräknade sädgässen på goda grunder antas ha varit taigasädgäss. Uppgift om andelen taigasädgäss vid Hammarsjön saknas för säsongerna 2004/05–2008/09. Under de senaste fyra säsongerna har så gott som samtliga sädgäss som setts på fälten inom detta område varit tundrasädgäss medan flockar på upp till 415 taigasädgäss har setts på Rinkaby ängar och Hovby ängar.

Under åren 1947–1960 rastade sädgässen höst och vår vid Araslövsjön, Hammarsjön och Egeside. Även under de följande 16 åren ankom gässen i slutet av september och flyttade bort i början av maj, men ett ökande antal stannade kvar över vintern. Någon gång under 60-talet eller i början av 70-talet började gässen även uppträda vid Trolle-Ljungby och Oppmannasjön + Råbelövsjön.

Ett flertal förändringar inträffade under de senaste 37 säsongerna. Tidigare bortflyttning om våren gjorde att antalet sädgäss i april minskade från drygt 5000 fåglar vid den första räkningen till knappt några alls från och med 1997. En liknande förändring om än i mindre skala kan ha skett under hösten, ty 389 fåglar inräknades i september 1977, den enda septemberräkning som genomfördes före 1993. Generellt sett räknades förre sädgäss fram till och med säsongen 1986/87 än därefter. Totalsiffror på över 22 000 fåglar noterades vid fem tillfällen under perioden 1991/92–2004/05 och det högsta inräknade antalet var 24 000 fåglar i december 1997. Under hårda vintar lämnade de flesta eller alla sädgäss Nordostskåne.

Bortsett från Egeside och Ivösjön uppvisar de olika räkningsområdena i stort sett samma tids- och antalsmässiga förändringar som området som helhet. Trolle-Ljungby var det område som vanligtvis hyste flest rastande och övervintrande sädgäss och säsongshögsta överskred ofta 10 000 fåglar (15 802 i november 2003). Oppmannasjön + Råbelövsjön uppvisade de största mellanårsvariationerna. Under de flesta säsongerna uppgick säsongshögsta till 2 000–2 500 fåglar vid Araslövsjön + Gummastorpasjön och c:a 5000 fåglar vid Hammarsjön. Egeside har däremot varit en typisk övervintrings- och vårrastlokal med få sädgäss på hösten, ofta inga alls i oktober. Säsongshögsta uppgick under perioden 1987/88–2005/06 vanligtvis till 2500–4000 fåglar.

Under de flesta av de senaste 25 säsongerna har antalet taigasädgäss i Nordostskåne vid åtminstone någon inventering uppgått till drygt 20 % av det totala antalet i Västpalearktis. Under samma period har, med undantag för Hammarsjön från och med säsongen 2004/05, vart och ett av de fem huvudräkningsområdena hyst mer än en procent av världspopulationen, Trolle-Ljungby ofta mer än tio procent. Dessa områden är således av internationell betydelse för rastande och övervintrande taigasädgäss.

Före 1960-talet födosökte sädgässen under höst

och vinter framförallt på gräsmark och klövervallar, medan gräsmarker var det habitat som prefererades under våren, såväl då som senare. Denna preferens för gräsmarker förklarar varför sädgässen fram till och med 1960 rastade i stora flockar längs med Helgeån, samtidigt som arten knappast alls besökte Trolle-Ljungby-området. Visserligen sökte sädgäss föda på åkermark i Skåne redan för 200 år sedan, men det var först med jordbrukets mekanisering under efterkrigstiden som födosök på åkermark blev möjlig i någon större omfattning. Maskinell upptagning av potatis och sockerbetor lämnar mycket spill och det var just detta spill som möjliggjorde för gässen att börja utnyttja fälten i Trolle-Ljungby-området för födosök. Med ett rikt utbud på föda, framförallt skördespill, tillgång till en säker nattplats (skärgård) i närheten samt en utformning av jakten som inte skrämde bort gässen utvecklades Trolle-Ljunby-området till ett rast- och övervintringsområde för ett mycket stort antal taigasädgäss.

Att fåglar överger sina traditionella vinterkvarter till förmån för lokaler som ligger närmare häckningsområdena kallas med ett engelskt ord för ”short-stopping”. Detta fenomen har beskrivits för ett flertal arter gäss. Uppgifterna om taigasädgåsens förekomst i Nordostskåne omfattar dock, till skillnad från de publicerade fallen, även tiden innan denna utveckling inleddes. På 1950-talet utnyttjades Nordostskåne endast som rastlokal höst och vår av gäss som övervintrade i Danmark, Tyskland och Nederländerna. Stora arealer med höstsådda grödor och mildare vintrar tillät så småningom även övervintring, även om kraftigt snöfall ofta tvingade gässen söderut. Samtidigt med att villkoren för övervintring förbättrades i Nordostskåne, förbättrades längre norrut villkoren för rastande gäss, framförallt om våren. Detta ledde till att gässen började lämna området tidigare om våren. Sista fasen i den pågående utvecklingen skulle vara att taigasädgässen börjar söka sig till vinterkvarter som ligger ännu närmare häckningsområdena. Färre inräknade taigasädgäss i Nordostskåne under det senaste decenniet jämfört med närmast föregående decennium skulle kunna vara ett steg mot ett totalt försvinnande från regionen. Men färre gäss kan också bero på en populationsnedgång.

Mildare vintrar i Sydsverige kan leda till ytterligare förändringar i gåspopulationernas utbredning vintertid. Under det senaste decenniet har tundrasädgåsen börjat övervintra i såväl Danmark som vid Hammarsjön. I framtiden kan tundrasädgåsen komma att ersätta taigasädgåsen som den talrikaste gåsarten i Nordostskåne vintertid. Även spetsbergsgåsen kan komma att etablera sig som övervintrare i denna del av Sverige. I vilket fall som helst finns det goda skäl för medlemmarna i Nordöstra Skånes Fågelklubb att fortsätta sin övervakning av rastande och övervintrande gäss.

Appendix 1. Number of Bean Geese recorded at mid-monthly counts in the census area Trolle-Ljungby, 1976/1977–2013/–. A bar (–) indicates that no complete count was carried out that month.
Antalet sädgäss inräknade vid mittmånads-inventeringar i räkningsområdet Trolle-Ljungby säsongerna 1976/1977–2013/–. Minustecken (–) anger att ingen komplett inventering genomfördes den månaden.

	October	November	December	January	February	March	April
76/77	–	1 860	–	172	–	1 663	–
77/78	930	3 135	1 500	1 600	0	1 500	1 375
78/79	1 135	1 090	1 500	0	0	3 100	930
79/80	400	3 310	430	360	0	983	996
80/81	731	2 318	1 043	522	950	574	1 363
81/82	1 290	2 240	220	0	0	1 865	1 130
82/83	230	2 400	3 080	2 500	466	900	1 340
83/84	380	3 240	1 532	1 755	810	1 000	1 490
84/85	460	2 042	1 550	771	300	150	1 529
85/86	110	4 334	487	159	320	1 942	1 850
86/87	65	2 330	2 533	0	0	0	480
87/88	230	1 264	1 481	2 340	2 229	2 320	331
88/89	12	2 225	2 000	3 022	3 368	571	0
89/90	82	1 572	3 138	3 262	3 200	46	0
90/91	87	5 803	5 690	4 014	1 500	200	0
91/92	4	7 500	4 610	6 895	4 295	76	0
92/93	534	10 655	3 637	3 770	2 660	509	0
93/94	564	7 570	4 920	3 560	3 610	965	0
94/95	658	12 020	7 140	6 955	3 432	2	0
95/96	0	6 025	5 100	208	4 100	6 674	66
96/97	6	8 850	10 234	1 489	785	8	0
97/98	0	9 417	13 874	5 314	1 578	165	0
98/99	0	12 321	7 895	7 060	1 686	0	0
99/00	1 296	10 092	4 613	4 134	1 030	0	0
00/01	10	2 295	5 792	5 191	4 964	19	0
01/02	10	8 882	1 743	1 543	1 430	0	–
02/03	392	5 499	12 011	4 888	2 908	7	0
03/04	3	15 802	7 990	5 269	2 526	105	–
04/05	61	11 990	3 687	1 787	3 867	4 050	–
05/06	0	1 677	5 317	3 970	4 598	1 636	–
06/07	0	1 380	4 391	752	2 990	0	–
07/08	241	6 730	8 318	1 920	1 510	40	–
08/09	0	2 400	8 100	1 296	3 790	0	–
09/10	110	4 423	6 305	3 942	872	4 825	–
10/11	1 915	5 113	2 581	126	350	1 593	–
11/12	980	6 000	2 908	1 180	450	0	–
12/13	0	1 888	–	875	882	8 509	–
13/14	110	1 485	12 010	–	–	–	–

Appendix 2. Number of Bean Geese recorded at mid-monthly counts in the census area Oppmannasjön + Råbelövsjön, 1976/1977–2013/–. A bar (–) indicates that no complete count was carried out that month.
Antalet sädgäss inräknade vid mittmånads-inventeringar i räkningsområdet Oppmannasjön + Råbelövsjön säsongerna 1976/1977–2013/–. Minustecken (–) anger att ingen komplett inventering genomfördes den månaden.

	October	November	December	January	February	March	April
76/77	–	554	–	2	–	840	–
77/78	0	75	15	205	–	1 700	630
78/79	280	–	–	0	0	0	–
79/80	0	80	800	84	0	285	230
80/81	0	3	2	0	0	920	455
81/82	121	510	0	0	0	480	540
82/83	62	645	60	270	0	1 025	515
83/84	0	515	0	190	210	1 600	510
84/85	217	350	925	250	1	11	602
85/86	0	140	0	0	0	300	8
86/87	20	560	840	0	0	0	675
87/88	5	950	600	400	35	1 175	350
88/89	19	3 150	425	893	725	3	274
89/90	195	340	400	312	886	100	100
90/91	75	1 250	1 300	450	0	454	90
91/92	0	950	1 100	402	1 555	130	0
92/93	70	1 400	2 300	1 500	80	80	0
93/94	100	940	650	121	190	370	0
94/95	120	1 133	602	130	60	355	0
95/96	120	685	2 750	5	0	370	0
96/97	195	1 023	725	0	535	45	0
97/98	750	2 231	4 850	2 050	1 200	224	7
98/99	7	1 402	4	238	0	493	0
99/00	422	1 685	2 455	80	1 423	169	0
00/01	0	1 008	800	410	760	24	0
01/02	0	2 650	3 780	500	1 253	7	0
02/03	200	8 807	2 609	350	460	109	52
03/04	0	3 550	1 070	803	760	2 280	–
04/05	70	5 900	2 283	550	1 158	378	–
05/06	13	765	1 945	1	0	0	–
06/07	2	8 150	2 669	1 521	545	5	–
07/08	220	1 990	77	1 830	90	85	–
08/09	0	1 416	777	1 240	1 135	162	–
09/10	60	300	1 630	0	24	20	–
10/11	200	1 395	0	0	0	853	–
11/12	30	75	1 500	560	52	2	–
12/13	0	65	–	2	560	1 190	–
13/14	8	526	186	¬–	–	–	–

Appendix 3. Number of Bean Geese recorded at mid-monthly counts in the census area Araslövsjön + Gummastorpasjön, 1976/1977–2013/–. A bar (–) indicates that no complete count was carried out that month.
Antalet sädgäss inräknade vid mittmånads-inventeringar i räkningsområdet Araslövsjön + Gummastorpasjön säsongerna 1976/1977–2013/–. Minustecken (–) anger att ingen komplett inventering genomfördes den månaden.

	October	November	December	January	February	March	April
76/77	–	540	–	69	–	990	–
77/78	871	2 095	1 366	864	140	1 800	1 144
78/79	490	–	1 040	80	0	1 000	–
79/80	400	1 030	140	110	0	186	597
80/81	225	1 650	7	500	787	1 593	378
81/82	535	1 600	1 450	0	69	4 630	1 808
82/83	577	1 850	2 067	600	8	3 127	982
83/84	370	1 093	0	1 191	11	1 578	810
84/85	500	537	2 817	0	0	361	350
85/86	110	173	1 282	0	0	875	390
86/87	539	394	2 595	0	2	80	5
87/88	12	454	1 960	2 055	2 325	3 204	0
88/89	0	350	907	2 050	501	0	0
89/90	80	11	1 690	2 000	1 945	0	0
90/91	75	398	2 155	2 890	597	75	0
91/92	1	540	1 746	2 435	3 776	120	0
92/93	87	1 204	1 369	2 170	2 170	3 112	2
93/94	22	1 002	1 612	827	900	1 116	2
94/95	32	1 445	1 375	2 250	2 505	1	1
95/96	22	1 747	681	110	3 210	2 833	8
96/97	0	1 021	2 014	600	1 091	1	0
97/98	0	770	1 090	2 351	919	13	0
98/99	0	220	1 456	59	549	133	0
99/00	402	74	1 232	2 044	814	150	0
00/01	30	23	1 643	3 486	2 338	11	0
01/02	0	1 554	1 606	328	686	6	0
02/03	104	3 350	2 223	1 243	2 205	42	12
03/04	0	623	3 500	383	887	1 950	–
04/05	86	1 400	1 335	450	0	600	–
05/06	200	405	1 835	14	417	150	–
06/07	850	1 980	2 575	2 386	2 000	70	–
07/08	38	330	1 830	1 819	620	11	–
08/09	0	50	1 517	1 792	1 533	0	–
09/10	0	363	2 000	1 145	773	220	–
10/11	270	0	820	0	328	1 283	–
11/12	68	2 350	570	922	1 400	150	–
12/13	20	74	–	400	1 095	3 395	–
13/14	0	23	700	–	–	–	–

Appendix 4. Number of Bean Geese recorded at mid-monthly counts in the census area Hammarsjön, 1976/1977–2013/–. A bar (–) indicates that no complete count was carried out that month.
Antalet sädgäss inräknade vid mittmånads-inventeringar i räkningsområdet Hammarsjön säsongerna 1976/1977–2013/–. Minustecken (–) anger att ingen komplett inventering genomfördes den månaden.

	October	November	December	January	February	March	April
76/77	–	590	–	189	–	1 740	–
77/78	42	172	1 000	2 150	740	4 450	2 012
78/79	1	–	–	0	0	2 000	–
79/80	7	336	1 805	1 465	1	2 400	2 610
80/81	0	1 300	760	1 100	2 200	1 875	600
81/82	23	327	255	0	0	2 370	970
82/83	131	45	1 750	2 427	128	4 910	670
83/84	6	336	300	3 491	2 260	4 930	771
84/85	380	952	4 148	440	586	5 998	1 303
85/86	75	450	852	110	192	1 014	1 010
86/87	0	8	1 387	0	184	1 352	441
87/88	0	328	7 705	1 143	4 831	4 527	211
88/89	0	1 375	4 445	10 595	4 210	305	0
89/90	15	0	2 576	5 695	3 808	62	0
90/91	105	2 350	4 858	6 139	2 355	184	20
91/92	0	1 407	4 978	8 961	6 228	10	7
92/93	71	2 010	2 275	4 959	8 180	978	10
93/94	100	646	1 044	6 009	1 602	1 664	0
94/95	0	2 564	7 074	4 200	4 901	67	0
95/96	106	879	3 110	100	290	1 004	150
96/97	0	3 232	4 270	1 017	4 750	461	9
97/98	180	7 015	3 550	5 355	4 570	314	0
98/99	0	2 140	4 230	2 514	3 150	55	0
99/00	172	1 350	8 290	5 040	2 034	0	0
00/01	0	860	2 703	4 230	4 435	24	0
01/02	0	3 577	4 579	514	3 565	0	0
02/03	13	2 824	2 591	897	960	144	0
03/04	0	3 716	2 276	3 110	1 317	225	–
04/05	26	3 100	5 375	4 521	3 038	2 761	–
05/06	2	820	3 650	3 450	2 875	2 225	–
06/07	15	6 750	3 570	3 020	2 173	2	–
07/08	12	5 700	2 700	5 510	5 600	2	–
08/09	0	2 200	680	5 550	2 450	108	–
09/10	271	1 710	4 490	1 734	2 307	3 210	–
10/11	31	5 600	2 050	369	990	2 904	–
11/12	265	4 250	4 500	3 901	957	1	–
12/13	0	1 110	–	4 275	3 332	2 980	–
13/14	0	203	5 540	–	–	–	–

Appendix 5. Number of Bean Geese recorded at mid-monthly counts in the census area Egeside, 1976/1977–2013/–. A bar (–) indicates that no complete count was carried out that month.
Antalet sädgäss inräknade vid mittmånads-inventeringar i räkningsområdet Egeside säsongerna 1976/1977–2013/–. Minustecken (–) anger att ingen komplett inventering genomfördes den månaden.

	October	November	December	January	February	March	April
76/77	–	23	–	177	–	574	–
77/78	22	23	1 100	3 100	–	1 690	480
78/79	0	–	–	648	0	517	–
79/80	18	305	453	17	0	1 390	–
80/81	0	29	263	1 700	1 100	412	691
81/82	67	104	0	0	0	8 000	2 000
82/83	16	3	1 243	950	1 046	3 500	10
83/84	14	250	200	2 780	1 610	1 850	1 250
84/85	352	0	2 409	0	0	1 760	1 585
85/86	0	21	740	0	121	2 630	980
86/87	50	66	620	0	0	10	160
87/88	0	17	1 017	2 350	4 924	6 541	422
88/89	0	10	4 244	3 400	890	500	565
89/90	0	54	0	5 090	3 268	420	380
90/91	0	780	3 700	3 420	516	698	165
91/92	0	0	1 210	5 181	710	500	500
92/93	0	41	2 738	3 700	2 295	15	180
93/94	0	23	1 230	3 696	2 500	3 000	375
94/95	0	356	2 175	3 687	1 829	270	100
95/96	0	79	995	200	30	2 660	0
96/97	0	384	1 450	0	1 299	0	50
97/98	0	500	700	1 320	360	1 050	0
98/99	0	3	150	300	649	1 400	0
99/00	8	0	220	2 620	1 019	70	1
00/01	0	9	240	2 320	1 160	500	0
01/02	25	1 560	2 800	877	4 300	40	0
02/03	2	313	2 840	1 009	1 065	31	0
03/04	0	15	7 990	732	573	0	–
04/05	0	257	1 680	2 738	1 228	651	–
05/06	2	5	3 686	40	370	116	–
06/07	0	69	630	843	994	1	–
07/08	0	806	937	2 517	800	0	–
08/09	0	0	950	1 112	675	16	–
09/10	0	33	638	210	170	1 070	–
10/11	30	158	180	0	470	1 650	–
11/12	19	168	2 901	2 992	1 951	0	–
12/13	0	1 145	–	1 198	1 406	740	–
13/14	0	959	839	–	–	–	–

Appendix 6. Number of Bean Geese recorded at mid-monthly counts in the census area Ivösjön, 2006/2007–2013/–. A bar (–) indicates that no complete count was carried out that month.
Antalet sädgäss inräknade vid mittmånads-inventeringar i räkningsområdet Ivösjön säsongerna 2006/2007–2013/–. Minustecken (–) anger att ingen komplett inventering genomfördes den månaden.

	October	November	December	January	February	March	April
06/07	–	–	467	–	1 165	12	–
07/08	0	600	2 000	1 250	211	0	–
08/09	0	0	10	725	1 750	0	–
09/10	0	0	110	260	16	35	–
10/11	0	370	0	38	109	470	–
11/12	10	300	620	425	366	0	–
12/13	0	311	–	637	3	345	–
13/14	4	560	127	–	–	–	–