

Occurrence of hybrid geese in Sweden – a conservation problem?

Förekomst av gåshybrider i Sverige – ett naturskyddsproblem?

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Abstract

This report provides basic data about hybrid geese and mixed pairs in Sweden; combinations of species, numbers, trends and origins, which can serve as a framework for future studies. Data published in national, regional and local magazines and reports as well as unpublished observations through August 2007 have been analysed. Sightings in this report were based on the observers' suggestion of parent species. No less than 17 species were involved in the hybrid geese sighted in Sweden. Some of the combinations of species involved the red-listed species Lesser White-fronted Goose, the nominate race of Taiga Bean Goose and Red-breasted Goose. The first combinations of species appeared in Sweden already 1918-1930s, but since the last half a century, the number of hybrid geese

in Sweden shows a positive trend. Several explanations to this increasing trend is proposed but not further analysed. Among all the several theories proposed for hybridisation in geese, field data from Swedish goose haunts support at least two; the "Best-Option-Hypothesis" and "Inter-specific mate choice following false imprinting".

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Introduction

Inter-specific hybridisation is exceptionally common in wildfowl, and even inter-generic hybridisation is not unknown (Johnsgard 1960, Scherer & Hilsberg 1982, McCarthy 2006). Among true geese, almost every combination of hybrid is possible, both within and between the two genera, *Anser* and *Branta* (Ogilvie 1978). Hybrids are often produced in captivity but are comparatively rare in the wild (Rutschke 1997). Fertile hybrids are usual within goose genera but not always between them (Owen 1980; but see Kear 1990). All the grey geese are similar genetically (Ruokonen et al. 2000), and many fertile crosses have been produced. Crosses between the Greylag Goose *Anser anser* and Swan Goose *Anser cygnoides*, for instance, are completely fertile (Darwin 1859, 1880), but a slight chromosome difference can cause reduced hatchability at back-crossing (Lärn-Nilsson 1996). The several fertile inter-generic crosses between *Anser* and *Branta* indicate the very close relationship existing between these two morphologically fairly

distinct groups (Johnsgard 1960). Still, few studies have tried to measure the importance of hybridisation in terms of actual number of individuals (but see Delany 1993, Randler 2000, Rowell et al. 2004). For Sweden, no such study has previously been done, even if trends for hybrids have been discussed shortly in two papers (Lerner 2005a, Lerner & Kampe-Persson 2006).

That closely related species interbreed and produce fertile hybrids is relatively rare in nature, where interbreeding is usually avoided by the action of geographical, ecological, behavioural or morphological barriers (May 1970). When separated by geographical barriers, species may be less likely to evolve ecological, behavioural or morphological mechanisms to avoid interbreeding. In such case, hybridisation may be facilitated when a species is introduced in a region that contains a close relative. Hybridisation caused by fauna manipulation is of that reason a conservation issue, because it may alter the genetic structure and reduce the fitness of native populations. A number of cases corroborate the importance of this phenomenon in birds.

Through fauna manipulation, hybridisation can become a severe conservation problem, sometimes threatening native populations by extinction. The introduction of the Ruddy Duck *Oxyura jamaicensis* to England in the 1940s is an illustrative example of this (Green & Hughes 1996, Hughes 1996, Persson & Urdiales 1997, Muñoz-Pomer 2006, Hughes et al. 2006). After establishing a naturalised population on the British Isles, the Ruddy Duck started to spread to other countries, where it came in contact with its native relative, the White-headed Duck *Oxyura leucocephala*. The two species started to hybridise, and the hybrids turned out to be fertile. The situation was aggravated by the fact that both Ruddy Duck males and hybrid males were dominant over White-headed Duck males, at the same time as the White-headed Duck was recovering from a very low population level (Torres 2001).

Also the Fennoscandian Lesser White-fronted Goose *Anser erythropus* conservation project has been affected by hybridisation (Aarvak & Timonen 2004). When genetic studies revealed that approximately 25% of the studied captive Lesser Whitefronts, used in the Swedish re-establishing project (Andersson 2004) and the Finnish restocking project (Markkola et al. 1999), carried the mitochondrial DNA of Siberian White-fronted Goose *Anser albifrons albifrons* (Ruokonen 2000, 2001, Tegelström et al. 2001), further releases were stopped in both countries.

Delaying conservation measures within this field can prove very expensive. Reducing the British Ruddy Duck population to the level it had when the problem of hybridisation with White-headed Duck became known will take several years and be very costly (Smith et al. 2005). To that must be added the cost of eradicating all Ruddy Ducks and hybrids in those countries in Europe, North Africa and the Middle East where the species has spread to since 1980. These are the extra costs, coming on top of the cost to eradicate the British population in 1980 of about 300 individuals. Accordingly, when actions must be taken to prevent hybridisation, it is of utmost importance that these can be decided on a sound basis and implemented without unnecessary delay.

This study aims at providing basic data about hybrid geese and mixed pairs in Sweden, combinations of species, numbers, trends and origins, which can serve as a framework for future studies, especially when conservation measures, such as control programmes or eradication, are actualised. Special attention was paid to species included

on the Swedish Red List. Included on this list are the Lesser White-fronted Goose as *critically endangered* and the Taiga Bean Goose *Anser fabalis* as *near threatened*, while the nominate race of the latter species is included as *vulnerable* (Gärdenfors 2005). Also, attention was paid to the Red-breasted Goose *Branta ruficollis*, on the IUCN Red List regarded as *vulnerable* (IUCN 2006).

Material and methods

Hybrid geese often present problems of identification. In some hybrids, morphological characters from both parents are obvious, as for example in crosses between Greylag and Greater Canada Goose *Branta canadensis*. Hybrids between closer relations than these might be harder to distinguish, as for example crosses between Lesser and Siberian White-fronted Goose (see, for example, Lerner 2005a). Identification is further complicated by individual differences within crosses (Randler 2001), differences depending of which species the parent male was, and the existence of second-generation hybrids (Lack 1974). For crosses between Ruddy and White-headed Duck, the characters of the hybrid depend on which species the parent male was (Urdiales & Pereira 1993). The same seems to apply to hybrid geese (cf. Olsson 1954). In some crosses, large differences exist even among individuals from the same brood (see e.g. Lebreton 1983, Rodríguez & Palacios 1993, Palacios & Rodríguez 1999).

These problems of identification, combined with inexperience in observing odd geese, have resulted in a number of misidentifications in Sweden (Amcoff et al. 1989, Carlsson et al. 2006). The first crosses between Greylag and Greater Canada Goose seen in a winter flock, for instance, were recorded as Barnacle Geese *Branta leucopsis* (Bolund 1964). Several crosses between Barnacle and Bar-headed Goose *Anser indicus* were reported as hybrids between Bar-headed Goose and either Greylag or Greater Canada Goose, while crosses between Barnacle and Snow Goose *Anser caerulescens* often were reported as Blue Goose; the Blue Goose is a colour morph of Snow Goose. Crosses between Greater Canada and Siberian White-fronted Goose have been reported as hybrids between Barnacle and Lesser White-fronted Goose. In Blekinge, crosses between Lesser White-fronted Goose and Cackling Goose *Branta hutchinsii minima* were initially reported as Lesser White-fronted Geese (Nilsson 1983), while in Skåne, a male Cape Shelduck *Tadorna cana* was reported as a hybrid

between Ruddy Shelduck *Tadorna ferruginea* and Greylag Goose. Albinistic Greater Canada Geese have been reported as hybrids between Greater Canada and either Snow or Bar-headed Goose, while some juvenile Bar-headed were reported as hybrids. Most of the sighted second-generation hybrids have, of obvious reasons, most likely been reported as first-generation ones.

This report is based on data published in national, regional and local magazines and reports, observations made by the authors (HKP and HL), and unpublished sightings made by others, reported either to the authors or on Svalan (www.artportalen.se), up to August 2007. Also, several regional rarities committees have provided information and two preliminary papers (Lerner 2005a, Lerner & Kampe-Persson 2006) enhanced reports of hybrids. All existing data were not available for this report however, partly because many bird-watchers pay little attention to these birds and partly because all regional and local publications were not accessible.

In general, sightings in this report were based on the observers' suggestion of parent species. In Sweden, hybrids are rarely considered by local, regional or national rarities committees. In some cases, for instance when the same bird was given more than one combination of species by different observers, or as in the cases given above, misidentifications were corrected. Omitted were all hybrids where only one of the parent species was identified. Combinations of species for which all available sightings were denoted either probable or possible were excluded. In all but a few instances when sightings are included in this report, the word probable is deleted, a word that some observers have used for nearly every single hybrid reported by them. Also, mixed pairs, where a male of one species was paired to a female of another species, were included. These are more seldom reported.

The nomenclature follows recommendations of Commissie Systematiek Nederlandse Avifauna (Sangster et al. 1999, 2003), which means that Bean Goose is represented by Taiga Bean Goose *Anser fabalis* and Tundra Bean Goose *Anser serrirostris*, Canada Goose by Greater Canada Goose *Branta canadensis* and Lesser Canada Goose *Branta hutchinsii*, and Brent Goose by Dark-bellied Brent Goose *Branta bernicla*, Pale-bellied Brent Goose *Branta hrota* and Black Brant *Branta nigricans*.

Combinations of species in the headings in the Appendix are given in alphabetical order, without indicating which of the parents being male or female. For second and third generation hybrids sci-

entific names within brackets refer to one of the parents.

Abbreviations of geographical provinces, given in brackets after each site name, are in accordance with those used for national reports (SOF 2002, 2006). For observations published in bird reports or on Svalan (www.artportalen.se), as well as earlier unpublished ones, name(s) of observer(s) is/are given in brackets if there was/were only one or two, while only the first name is given in case of more than two. This applies also to sightings where the identification was changed or modified by the authors.

For most combinations of species, all available data were included, in the text or in an Appendix, to facilitate future updates.

Results

No less than 17 species were involved in the hybrid geese sighted in Sweden through August 2007 (Tabell 1, Appendix). Involved in most first-generation combinations of species were the Barnacle Goose (ten), followed by the Greylag Goose (nine), the Greater Canada Goose (eight), and the Siberian White-fronted Goose and the Snow Goose (seven each). Represented by only one type each were the Ross's Goose *Anser rossii*, the Pale-bellied Brent Goose and the Red-breasted Goose. One species, the Greylag Goose, was also represented by a cross with a swan species, and mixed pairs with a duck species and Crane *Grus grus* as well.

Some combinations of species have been known for a long time, the first ones (Siberian White-fronted Goose x Snow Goose, Siberian White-fronted Goose x Taiga Bean Goose, Siberian White-fronted Goose x Bar-headed Goose and Greylag Goose x Greater Canada Goose) appeared already in 1918–1930s (Tabell 2). Most of the other combinations of species were only reported during the last 30 years; second-generation ones mainly since the mid-1980s (Tabell 2, 3).

Ever since the Greater Canada Goose was introduced in Sweden three quarters of a century ago, crosses between this species and the Greylag Goose have been by far the most common combination of species. During the non-breeding season, some of the hybrids were seen in Greylag Goose flocks but the vast majority among Canada geese. In flocks of Greylag and Greater Canada Geese staging and wintering in South Sweden, there were no clear trends in the frequencies of hybrids during the last 36 years (Tabell 4). In Greylag flocks, the average frequency was higher during the years 1991–

Table 1. Different first-generation combinations of species observed in Sweden through August 2007. *Förstagenationshybrider som observerats i Sverige till och med augusti 2007.*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 <i>A. albifrons</i>	-	X		X			X	X	X				X			X	
2 <i>A. anser</i>	X	-	X	X	X	X		X	X				X			X	
3 <i>A. brachyrhynchus</i>		X	-					X			X						
4 <i>A. caerulescens</i>	X	X		-				X	X	X			X			X	
5 <i>A. canagica</i>		X			-											X	
6 <i>A. cygnoides</i>		X				-							X				
7 <i>A. erythropus</i>	X						-						X		X	X	
8 <i>A. fabalis</i>	X	X	X	X				-			X		X				
9 <i>A. indicus</i>	X	X		X					-				X			X	
10 <i>A. rossii</i>				X						-							
11 <i>A. serrirostris</i>			X					X			-						
12 <i>B. bernicla</i>												-		X		X	
13 <i>B. canadensis</i>	X	X		X		X	X	X	X				-			X	
14 <i>B. hrota</i>												X		-			
15 <i>B. hutchinsii</i>							X								-	X	
16 <i>B. leucopsis</i>	X	X		X	X		X		X			X	X		X	-	X
17 <i>B. ruficollis</i>																X	-

2001 than earlier or later, 0.27‰ (N=191,148) vs. 0.05‰ (N=39,974) and 0.06‰ (N=130,556). Average frequencies for the entire period were 0.17‰ (N=361,678) in Greylag flocks and 0.92‰ (N=157,489) in Canada flocks, while the corresponding values for the 2005 autumn, the year with the largest sample sizes, were 0.06‰ (N=49,719) and 2.13‰ (N=18,764) respectively. Among Canada geese wintering in Kristianstad, high frequencies were noted already four decades ago, with, for instance, 8.57‰ (N=350) in 1964/1965 and 4.00‰ (N=500) in 1965/1966 (Axelsson 1967). The second most commonly reported combination of species is Greater Canada and Barnacle Goose, and the third Lesser White-fronted and Barnacle Goose.

An estimate of the total number of hybrids in Sweden was made for 2005, the latest year with good data (Table 5). For crosses between Greylag and Greater Canada Goose, an estimate of the total number of individuals in Sweden was obtained by multiplying observed frequencies (Table 4) with population sizes of the two species. Estimated sizes of the post-breeding populations in 2005 were 210,000 Greylag Geese and 100,000 Greater Canada Geese (Nilsson 2006, Svenska Jägareförbundet 2006). In that way, a total of 226 hybrids was obtained, 13 among the Greylags and 213 among the Greater Canadas. A similar calculation was made for crosses between Pink-footed and Taiga Bean Goose, as 20% of all staging bean geese in Sweden in the late 2005 autumn were carefully checked by

HKP. However, as it was uncertain whether there were any hybrids in the unchecked flocks, the result is presented as an interval, ranging from the number of hybrids actually seen to the calculated figure. For other combinations of species, estimates were based on available sightings.

Discussion

The problems of identification

A chain of factors, running from occurrence to inclusion, such as observer availability, knowledge and devotion of the field observers, detectability, reporting frequency, publishing frequency, and the ability of the reviewers to find the sources, creates the necessary conditions for how well a review article can describe the true picture.

Staging and wintering geese in Sweden started to be checked more in detail from the late 1950s (e.g. Lennerstedt 1962, Markgren 1963). Since then, the number of persons checking the geese have doubled many times over. Better binoculars and telescopes, as well as better roads and access to watch towers, have facilitated field observations. At the same time, however, most goose populations regularly occurring in Sweden have increased markedly in size (Nilsson 2006). These larger numbers, in combination with more and more multi-species flocks, make it in several places harder to spot hybrids today than earlier. During the period covered by this report, hybrids went unnoticed in two ways,

Table 2. Year of first observation for different combinations of species in Sweden. Also the year of first observation of a mixed pair is given for crosses where a mixed pair was reported earlier than a hybrid.

Årtal för förstafynd av olika hybridtyper i Sverige. Också förståår för blandpar har angetts när blandpar rapporterats tidigare än en hybrid.

	Hybrid	Pair
<i>Anser albifrons</i> x <i>Anser anser</i>	1988	1962
<i>Anser albifrons</i> x <i>Anser caerulescens</i>	Early 1930s	
<i>Anser albifrons</i> x <i>Anser erythropus</i>	1992	1991
<i>Anser albifrons</i> x <i>Anser fabalis</i>	1918	
<i>Anser albifrons</i> x <i>Anser indicus</i>	Early 1930s	
<i>Anser albifrons</i> x <i>Branta canadensis</i>	1985	1970
<i>Anser albifrons</i> x <i>Branta leucopsis</i>	Before 1959	
<i>Anser anser</i> x <i>Anas platyrhynchos</i>		2006
<i>Anser anser</i> x <i>Anser brachyrhynchus</i>	1994	
<i>Anser anser</i> x <i>Anser caerulescens</i>	1979	
<i>Anser anser</i> x <i>Anser canagica</i>	2004	
<i>Anser anser</i> x <i>Anser cygnoides</i>	1985	
(<i>Anser anser</i> x <i>Anser cygnoides</i>) x <i>Anser anser</i>	1987	
((<i>Anser anser</i> x <i>Anser cygnoides</i>) x <i>Anser anser</i>) x <i>Anser anser</i>	1992	
<i>Anser anser</i> x <i>Anser fabalis</i>	2001	1992
<i>Anser anser</i> x <i>Anser indicus</i>	1984	
(<i>Anser anser</i> x <i>Anser indicus</i>) x <i>Branta canadensis</i>		2006
<i>Anser anser</i> x <i>Branta canadensis</i>	Late 1920s	
(<i>Anser anser</i> x <i>Branta canadensis</i>) x <i>Anser anser</i>		Before 1984
(<i>Anser anser</i> x <i>Branta canadensis</i>) x <i>Branta canadensis</i>	1985	1982
(<i>Anser anser</i> x <i>Branta canadensis</i>) x (<i>Anser anser</i> x <i>Branta canadensis</i>)	1993	
<i>Anser anser</i> x <i>Branta leucopsis</i>	1984	
<i>Anser anser</i> x <i>Cygnus olor</i>	1972	
<i>Anser anser</i> x <i>Grus grus</i>		2007
<i>Anser brachyrhynchus</i> x <i>Anser fabalis</i>	1984	
<i>Anser brachyrhynchus</i> x <i>Anser serrirostris</i>	2006	
(<i>Anser brachyrhynchus</i> x <i>Anser serrirostris</i>) x <i>Anser brachyrhynchus</i>		2006
<i>Anser brachyrhynchus</i> x <i>Branta leucopsis</i>		2007
<i>Anser caerulescens</i> x <i>Anser fabalis</i>	1988	
<i>Anser caerulescens</i> x <i>Anser indicus</i>	1999	
<i>Anser caerulescens</i> x <i>Anser rossii</i>	2003	
<i>Anser caerulescens</i> x <i>Branta canadensis</i>	1978	
<i>Anser caerulescens</i> x <i>Branta leucopsis</i>	1987	1979
<i>Anser canagica</i> x <i>Branta leucopsis</i>	1993	
<i>Anser cygnoides</i> x <i>Branta canadensis</i>	1986	
<i>Anser erythropus</i> x <i>Branta canadensis</i>	1990	1989
<i>Anser erythropus</i> x <i>Branta hutchinsii</i>	1979	
(<i>Anser erythropus</i> x <i>Branta hutchinsii</i>) x <i>Branta leucopsis</i>		1983
<i>Anser erythropus</i> x <i>Branta leucopsis</i>	1985	
(<i>Anser erythropus</i> x <i>Branta leucopsis</i>) x <i>Branta canadensis</i>		1989
<i>Anser fabalis</i> x <i>Anser serrirostris</i>	2004	
<i>Anser fabalis</i> x <i>Branta canadensis</i>	1983/84	
(<i>Anser fabalis</i> x <i>Branta canadensis</i>) x <i>Branta canadensis</i>		2007
<i>Anser indicus</i> x <i>Branta canadensis</i>	1965	
<i>Anser indicus</i> x <i>Branta leucopsis</i>	1985	
(<i>Anser indicus</i> x <i>Branta leucopsis</i>) x <i>Anser anser</i>	1997	
(<i>Anser indicus</i> x <i>Branta leucopsis</i>) x (<i>Anser indicus</i> x <i>Branta leucopsis</i>)		1985
<i>Branta bernicla</i> x <i>Branta hrota</i>	2002	
<i>Branta bernicla</i> x <i>Branta leucopsis</i>	2004	
<i>Branta canadensis</i> x <i>Branta leucopsis</i>	1969	
(<i>Branta canadensis</i> x <i>Branta leucopsis</i>) x <i>Branta canadensis</i>	1997	
(<i>Branta canadensis</i> x <i>Branta leucopsis</i>) x <i>Branta leucopsis</i>	2006	2000
<i>Branta hutchinsii</i> x <i>Branta leucopsis</i>	1998	
(<i>Branta hutchinsii</i> x <i>Branta leucopsis</i>) x <i>Branta leucopsis</i>	2005	
<i>Branta leucopsis</i> x <i>Branta ruficollis</i>	1978	

Table 3. Number of new combinations of species in Sweden during different decades.

Antalet nya hybridtyper i Sverige fördelat på årtionden.

Decennium <i>Decade</i>	Antal <i>Number</i>
1910–1919	1
1920–1929	1
1930–1939	2
1940–1949	0
1950–1959	1 ¹
1960–1969	2
1970–1979	5
1980–1989	14
1990–1999	10
2000–2007	9

¹ = before 1959.

partly by flocks and families remaining unchecked, especially during the breeding season, and partly by bird-watchers paying little attention to hybrids. As a result of the latter, at least up to the late 1990s, the bulk of all sightings in most geographical areas was reported by only 1–3 persons. But even if many hybrids passed unnoticed for long periods, there were good chances that they, due to the longevity and mobility of geese in general (Owen 1980), were seen at least occasionally.

Identification of hybrid geese is not covered by field guides, and is rarely the theme of identification articles. By that, knowledge gained by the most devoted field observers is not passed on to others. Of that reason, the ability among bird-watchers in general to correctly identify encountered hybrids has improved slowly over time, mainly reflecting a

Table 4. Frequency (number of hybrids per 1000 geese) of Greylag Goose x Greater Canada Goose hybrids, including second-generation ones, in flocks of Greylag Goose and Greater Canada Goose, respectively, in South Sweden in the seasons 1970/71–2005/06. For the Greylag, only mid-September counts were used, while for the Greater Canada, the mid-monthly count with the largest number of checked individuals during the period September–February was used. Only censuses made by HKP were used. N = number of checked geese.

Frekvens (uttryckt som antal hybrider per 1000 gäss) av grågås x kanadagås-hybrider i flockar av grågås respektive kanadagås i Sydsverige säsongerna 1970/71–2005/06. För grågås utnyttjades endast mittmånadsinventeringar gjorda i september, medan för kanadagås utnyttjades den mittmånadsinventering med flest kontrollerade individer under perioden september–november. Endast inventeringar gjorda av HKP utnyttjades. N = antalet kontrollerade gäss.

	In Greylag Goose flocks <i>I flockar av grågås</i>		In Canada Goose flocks <i>I flockar av kanadagås</i>			In Greylag Goose flocks <i>I flockar av grågås</i>		In Canada Goose flocks <i>I flockar av kanadagås</i>	
	%	N	%	N		%	N	%	N
1970/71			0.00	243	1988/89	0.00	6700	0.00	233
71/72			0.00	204	89/90	0.00	9050	0.00	750
72/73			0.00	37	1990/91	0.00	9300	2.67	1500
73/74			0.00	300	91/92	0.82	13469	0.00	650
74/75			0.00	105	92/93	0.78	23225	1.25	3210
75/76			0.00	400	93/94				
76/77			0.00	297	94/95				
77/78			0.92	2169	95/96	0.09	10636		
78/79	3.81	525	0.00	5805	96/97	0.04	24162	1.50	2672
79/80			0.00	5092	97/98	0.13	15707		
1980/81			0.25	3981	98/99	0.09	23100	0.75	13386
81/82			0.00	3864	99/00	0.18	22813	1.70	18193
82/83			0.58	8600	2000/01	0.26	31039		
83/84	0.00	2468	1.32	12886	01/02	0.19	26997	0.63	12635
84/85	0.00	5031	0.39	5113	02/03	0.04	28334		
85/86			0.23	13000	03/04	0.08	24999	2.11	3317
86/87			0.40	5000	04/05	0.07	27504	0.29	13933
87/88	0.00	6900	0.87	1150	05/06	0.06	49719	2.13	18764

Table 5. Estimate of the total number of individuals of different combinations of species present in Sweden in 2005 (based on Table 4, studies by HKP in the 2005 autumn and reported observations; see text for details), compared with similar estimates for Great Britain in 2000 (Rowell et al. 2004) and in 1991 (Delany 1993) and Germany in 1998 (Randler 2000). Excluded were second-generation hybrids, and hybrids where none or only one of the parent species was identified.

Beräkning av totalantalet individer av olika hybridtyper som förekom i Sverige 2005 (bygger på Tabell 2, studier av HKP hösten 2005 samt rapporterade observationer 2005; se text för detaljer), jämfört med motsvarande beräkningar för Storbritannien 2000 (Rowell mfl 2004) och 1991 (Delany 1993) och Tyskland 1998 (Randler 2000). Andragenerationshybrider samt hybrider där ingen eller endast en av föräldraarterna identifierats exkluderades.

	Sweden	Great Britain	Germany	Great Britain
	2005	2000	1998	1991
<i>Anser albifrons</i> x <i>Anser anser</i>	1	12		13
<i>Anser albifrons</i> x <i>Anser erythropus</i>	2			2
<i>Anser albifrons</i> x <i>Branta canadensis</i>	6			7
<i>Anser albifrons</i> x <i>Branta leucopsis</i>	1		3	
<i>Anser anser</i> x <i>Anser caerulescens</i>	1	20		5
<i>Anser anser</i> x <i>Anser cygnoides</i>	1	57	38	2
<i>Anser anser</i> x <i>Anser fabalis</i>	2			
<i>Anser anser</i> x <i>Anser indicus</i>	2	6	6	3
<i>Anser anser</i> x <i>Branta canadensis</i>	226	88	140	262
<i>Anser anser</i> x <i>Branta leucopsis</i>	4			2
<i>Anser brachyrhynchus</i> x <i>Anser fabalis</i>	4–20			
<i>Anser brachyrhynchus</i> x <i>Anser serrirostris</i>	1			
<i>Anser caerulescens</i> x <i>Anser indicus</i>	1	1		
<i>Anser caerulescens</i> x <i>Branta canadensis</i>	2	2	1	4
<i>Anser caerulescens</i> x <i>Branta leucopsis</i>	1–2	2		2
<i>Anser canagica</i> x <i>Anser caerulescens</i>		1		
<i>Anser canagica</i> x <i>Anser indicus</i>		1		
<i>Anser canagica</i> x <i>Branta canadensis</i>		1		
<i>Anser canagica</i> x <i>Branta leucopsis</i>	1	5		
<i>Anser cygnoides</i> x <i>Anser indicus</i>			12	
<i>Anser cygnoides</i> x <i>Branta canadensis</i>		4	3	1
<i>Anser erythropus</i> x <i>Branta leucopsis</i>	15		1	
<i>Anser fabalis</i> x <i>Anser serrirostris</i>	1			
<i>Anser indicus</i> x <i>Branta canadensis</i>	1	1	12	2
<i>Anser indicus</i> x <i>Branta leucopsis</i>		1	5	
<i>Anser rossii</i> x <i>Branta leucopsis</i>			1	
<i>Branta bernicla</i> x <i>Branta leucopsis</i>	3			
<i>Branta canadensis</i> x <i>Branta leucopsis</i>	30	8	6	13
<i>Branta hutchinsii</i> x <i>Branta leucopsis</i>	3			
<i>Branta leucopsis</i> x <i>Branta ruficollis</i>	1		1	
Total:	310–327	210	229	318

general improvement in identification skill. Above all, individual variation within each combination of species have and will give rise to misidentifications. Individual variation is supposedly partly caused by which species the male is. Encountering hybrids where the male parent was of the opposite species compared to the normal can cause the ob-

server to believe that these birds were of another combination. Improvements in identification skill over time might explain some of the new combinations of species reported in Tables 2 and 3, but far from all.

As the aim of the study was to describe the occurrence of hybrid geese in Sweden, it was impossible

to restrict the material to only those hybrids that for certain were correctly identified. The more so as hybrids have to be studied genetically to be sure of their ancestry. It is not enough to see the hybrid together with its parents, as extra-pair fertilisation occurs also in mixed pairs (Berg 1937). Obvious misidentifications were corrected before inclusion in this report, but all of them were most likely not found. As the majority of all observations, also of the least reported combinations of species, were made by devoted field observers, the overall frequency of misidentifications was probably low. The largest remaining uncertainty regards crosses between Emperor *Anser canagica* and Barnacle Goose. Available sightings, some of them reported as unidentified Emperor Goose hybrids, were not included until one of them had been reported as a cross between these two species. Another kind of misidentifications was when second- and third-generation hybrids were reported as first-generation ones. This was probably of minor importance as such hybrids apparently occurred in very low numbers. After three generations of back-crossing it is probably no longer possible to identify the individual as a hybrid in the field.

The chance of being overlooked in the field is, of obvious reasons, higher for crosses between closely related species, with high morphological resemblance, than for inter-generic crosses, and higher for second- and third-generation hybrids than for first-generation ones. The most likely candidates of having passed unnoticed during the period covered by this study were the following combinations of species: Siberian White-fronted Goose x Lesser White-fronted Goose, Greylag Goose x Pink-footed Goose, Greylag Goose x Swan Goose, Greylag Goose x Taiga Bean Goose, Greylag Goose x Bar-headed Goose, Dark-bellied Brent Goose x Light-bellied Brent Goose, Snow Goose x Barnacle Goose, Greater Canada Goose x Barnacle Goose, Bar-headed Goose x Barnacle Goose and Lesser Canada Goose x Barnacle Goose. There are no data indicating to which extent hybrids were overlooked.

The interest of reporting and publishing observations of hybrid geese in Sweden has varied markedly during the past decades, among areas as well as years, which becomes evident when examining regional and national bird reports. The introduction of Svalan (Report system for Birds, www.artportalen.se) changed this by stimulating a higher reporting frequency and enhancing data availability. However, in the only study of reporting frequency so far it was found to be extremely low. Of hybrids

found during four mid-monthly counts of geese in South Skåne during the period September 2006–January 2007, only 5% (N=61) were reported on Svalan (Kampe-Persson 2007). This low figure was obtained even though data were extracted for a 16-day period each counting month.

The picture given in this study might be somewhat skewed, partly due to the omission of all hybrids where only one of the parents was identified and partly to an unknown number of misidentifications. If it had been possible to include also these sightings correctly identified, the total number of combinations of species might have been higher than now, especially second- and third-generation ones, and the relative frequencies of the different combinations of species had very likely been slightly different. For instance, as Swedish birders rarely differentiate between Lesser and Greater Canada Goose as hybrid parent, generally reporting all of them as the latter, the total number of sightings of crosses between Lesser Canada and Barnacle Goose had very likely been higher than now. As few geese of captive or semi-captive origin are reported correctly to the rarities committees, some sightings of small Canadas might have been hybrids. A better understanding in this issue might be reached with more written descriptions and photos of these birds.

In spite of the shortcomings discussed above, there are good reasons to accept the picture given in this study as a good representation of the true one.

Trends

During the latter half a century, the number of hybrid geese in Sweden shows a positive trend similar to that of the breeding populations of Greylag, Greater Canada and Barnacle Goose (Madsen et al. 1999), but also to the summer occurrence of northern breeders and exotic geese (Kampe-Persson & Lerner, in prep.). To which degree this trend is due to increasing breeding populations, to differences in number of birds of captive and semi-captive origin, to the summer occurrence of species normally breeding farther north, or to a higher reporting frequency is and will remain unknown.

The trend of an increasing number of first-sightings of new hybrid types from the 1980s is applicable to also other goose areas in Europe. In goose flocks in North and West Europe, it is nowadays normal to find a great variety of hybrids, especially crosses involving introduced species (Delany 1993, Lensink 1996, Randler 2000, van Horssen & Len-

sink 2000, Rowell et al. 2004, this study). When originating from birds used in re-stocking and re-establishment projects, also parts of native populations can be regarded as alien (Randler 2000). In Sweden, that applies to Taiga Bean, Greylag, Lesser White-fronted and Barnacle Goose (Svensson et al. 1999).

There were large similarities among Sweden, Germany and Great Britain, in total number of hybrids, that the majority (61–82%, though lower in Great Britain in 2000) was made up of crosses between Greylag and Greater Canada Goose, and that the minority was made up of at least 12 different combinations of species (Delany 1993, Randler 2000, Rowell et al. 2004, this study). Between-country differences for combinations of species with low numbers (less than 20 individuals) may be due to stochastic reasons, but notably crosses between Greylag Goose and Swan Goose were rarer in Sweden in 2005 than in Great Britain 2000 and Germany 1998. As geese are long-lived (for the Greylag Goose, see Kampe-Persson 2002), a single mixed pair can produce a large number of hybrids during their reproductive life, hybrids that can be alive long after their parents have died. In Skåne, one hybrid was more than 17 years old when last seen (this study). Hence, one reason that so many combinations of species were represented by less than 15 individuals might be that each combination was produced by a single pair.

Origins

Of hybrid geese seen free-flying in Sweden, some were born in captivity, semi-captivity or close to sites with captive breeding, others in the wild abroad, but the vast majority in the wild in Sweden. Also among those born in the wild most had at least one parent or ancestor of captive origin. The captive origin is obvious when it comes to the introduced Greater Canada Goose and aliens, but rarely for birds emanating from re-stocking or re-establishment programmes, or for escaped individuals of native species. Geese that have been bred in captivity for a number of generations are more prone to hybridise than their wild con-specifics (Randler 2000). In the Greylag Goose, for instance, the frequency of hybrids was markedly higher in naturalised than in natural populations (Bruns 1982, 1985, Sibley 1994, Kreutzkamp 1996, Randler 2000). Hence, effects of captive origin must be taken into consideration for a long time after that geese have been released for re-stocking or re-establishment.

As most hybrid geese have an obvious captive

origin, it might be more fruitful to ask: Which of the reported combinations of species were of natural origin? If, besides crosses involving introduced species, also those involving released and escaped parent birds are excluded, only seven combinations of species remain: Siberian White-fronted Goose x Lesser White-fronted Goose, Siberian White-fronted Goose x Barnacle Goose, Dark-bellied Brent Goose x Light-bellied Brent Goose, Dark-bellied Brent Goose x Barnacle Goose, Pink-footed Goose x Taiga Bean Goose, Pink-footed Goose x Tundra Bean Goose and Barnacle Goose x Red-breasted Goose. Most likely, Taiga Bean Goose x Tundra Bean Goose does not belong to this group.

Very high frequencies of hybrids between Taiga and Tundra Bean Goose were formerly reported from Central Europe (Johansen 1962, Bauer & Glutz von Blotzheim 1968, Litzbarski 1974, Cramp 1977, Ogilvie 1978, Owen 1980, Rutschke 1983a, 1983b, 1997, Klafs & Stübs 1987, Liebherr & Rutschke 1993, Rutschke & Liebherr 1996), with no less than 54%, 73% and 97% of all bean geese in Mecklenburg, Brandenburg and Hungary, respectively, reported as hybrids. These false conclusions were due to a typological approach, which did not account for the individual variation that occurs in the subspecies *fabalis* and *rossicus*, especially in the shape and coloration of the bill (Persson 1995b, 1997b). A careful check of mixed flocks, where one of the species occurred in low numbers, were recently carried out in Germany. The outcome of this study was the sighting of one mixed pair (Thomas Heinicke, pers. comm. to HKP).

During more than 40 years of careful checks of the European bean goose haunts neither Georges Huyskens nor Leo van den Bergh found any crosses between Taiga and Tundra Bean Goose (Huyskens 1986, 1999, Leo van den Bergh, in litt.), or any crosses or mixed pairs between Pink-footed and Taiga Bean Goose (Leo van den Bergh, in litt.). The lack of sightings south of the Baltic highlights the origin of the bean goose hybrids seen in Sweden, especially as it cannot be ruled out that one, or even both, of the parent birds in each pair was of captive origin. Five Pink-footed Geese of presumed captive origin were, for instance, sighted in Skåne in the autumns of 1995 and 1996 (Elleström et al. 1996, Green et al. 1997). The fact that two of the four sightings of hybrids between Taiga and Tundra Bean Goose in Skåne were done in early autumn, before the parent species started to arrive in this part of Sweden, gives support to a captive or semi-captive origin.

The first Pink-footed Goose reported breeding

in northern Fennoscandia bred paired to a Greater Canada Goose at Hammervatnet in Nord-Trøndelag in 1994 (Husby 1994). This was followed by a female that bred paired to a male Siberian White-fronted Goose at Lofoten in 2002 and 2003 (Birina 2005). Before the first breeding pair was found at Tromsø in 2003 (Irgens 2004), one Pink-footed Goose was caught together with moulting Taiga Bean Geese at Tana in 1971 (Tveit 1984), breeding was reported but never confirmed from Karasjøk (Gjershaug et al. 1994) and a family group of two adults and three young was found at Øysand in Sør-Trøndelag 6 September 1992 (Gustad 1993), the early date indicating that breeding might have taken place on the mainland. An increasing Pink-foot population in northern Fennoscandia, at the same time as the Taiga Bean Goose population decreases there, could result in hybridisation between these two species.

Hybridisation between Lesser and Siberian White-fronted Goose is believed to be occasional in the natural populations (Nagy 1950, Shackleton 1956, Voous & Wattel 1967, Rogers 1979, Panov 1989, Müller 2001, Lerner 2005a, this study, but see Van Impe 1982), although difficult to detect reliably due to the great morphological similarity of the two species. According to Peter Scott (*British Birds* 49(1956): 229): "It is my theory that hybrids between Lesser and European [Siberian] White-fronts occur from time to time among the geese visiting Britain. This idea is based (1) on the occurrence, in the winter flocks, of Lesser White-fronts which are paired to European [Siberian] White-fronts; (2) on observations of "Lesser White-fronts" which are unusually large; and (3) on the bill-measurements of a specimen from the Severn Estuary now in the British Museum (Natural History)." A male Lesser White-fronted Goose mated to a Siberian White-fronted Goose with two young, the young not distinguishable from those of Siberian Whitefronts, were seen at Slimbridge, Gloucestershire 6–7 March 1956 (Scott & Boyd 1956). Another mixed pair was seen at the same site 28 February–5 March 1969 (Smith 1970). An indication of the possible magnitude of hybridisation between these closely related species can be obtained by comparing with a similar pair of goose species in the Nearctic. Among 5471 Ross' and 8155 Snow Geese caught for ringing in USA during 1961–1968, there were 32 hybrids, corresponding to a frequency of hybrids of 2.34% (Trauger et al. 1971). Overall among birds, however, about one in 50,000 individuals (0.02%) is a hybrid (Mayr 1970).

Injuries can force migrating geese to remain in or close to their wintering quarters during the following breeding season. Sometimes such birds breed far south of their normal breeding range, paired to either a con-specific or a bird of another species. Examples of the former are the successful breeding of a Greylag Goose pair in northern Spain in 1993 (Moreno 1993) and of Tundra Bean Goose pairs in the Netherlands in 1993 and 1994 (Lensink 1996b) and of the latter, the unsuccessful breeding of a mixed pair of Taiga Bean and Greylag Goose in South Sweden in 1992 (this study). So, hybridisation outside the breeding range of one of the species making up a mixed pair is not always unnatural.

To understand the causes of hybridisation between waterfowl species, several theories have been proposed (for a summary, see Randler 2000, 2006). Field data from Swedish goose haunts support at least two of these: the "Best-Option-Hypothesis" and "Inter-specific mate choice following false imprinting".

In most cases, when breeding and breeding attempts of mixed goose pairs were recorded in Sweden, one of the parent species was represented by only one individual at that very site (this study). That applies not only to the rare species, but also to such numerous and wide-spread ones as the Greylag Goose and the Greater Canada Goose (Fabricius & Norgren 1987). These observations support the "Best-Option-Hypothesis". Instead of giving up breeding altogether, the singly bird mate with an individual of another species (Hubbs 1955).

Some of the Lesser White-fronted Goose males from the Swedish re-establishment project, which were released with Barnacle Geese as foster parents, later paired to Barnacle females (Lerner 2005a, this study). Such inter-specific mate choice after false imprinting has been demonstrated in the Greylag Goose (Fabricius 1991). Of 19 males and 16 females that had been cross-fostered by Canada geese in semi-captivity, five males paired to Canada females, while the other males and all females paired to Greylags. When widowed, these five males re-paired to a new partner which was always a Canada female. Two of the males paired as many as nine and five times. In the same study, all of 78 Greylag males that had been reared by conspecifics paired with females of their own species and never even courted Canada Geese. A detailed discussion on the factors involved in sex differences in sexual imprinting was given by ten Cate (1985).

Cross-fostering during natural conditions can oc-

cur either by a pair taking over a nest where a female already has started to lay (Fabricius 1983) or by brood amalgamation (Eadie et al. 1988, Beauchamp 1998, Randler 2005). Evidences of these behaviours are few from Sweden. A Greater Canada Goose pair took over a Whooper Swan *Cygnus cygnus* nest at Öfjärden (Ång) in 2001 (Thomas Birkö). Inter-specific nest parasitism was recorded in Fjällfotåsjön (Sk) in 1986, when a Barnacle Goose nest contained four Barnacle eggs and six Greylag eggs (Persson 1997a) of which the former hatched, and in Malmö (Sk) in 2007, when a Mute Swan *Cygnus olor* nest contained five swan eggs and one Greylag egg of which all hatched (Conny Hagman). Mixed broods of Greylag and Greater Canada Goose have been reported from Angarnsjöängen (Upl), where eight adult Canadas were followed by nine Canada goslings and ten Greylag goslings in 2004 (Söderholm 2005a), ten adult Canadas were followed by 11 Canada goslings and 11 Greylag goslings in 2005 (Söderholm 2005b) and eight adult Canadas were followed by 20 Canada goslings and four Greylag goslings in 2007 (Svante Söderholm), from Ivösjön (Sk), where a Greater Canada Goose pair was followed by two Canada goslings and one Greylag gosling in 2006 (HKP) and from Tidaholm (Vg), where a Greater Canada Goose pair was followed by two Canada goslings and two Greylag goslings in 2007 (Magnus Hallgren). In 2006, one Greylag gosling was seen together with a Canada family at Hörby (Sk) 4 July (Mattias Persson) and two Greylag goslings together with a Canada family at Lokasjön (Sm) 19 July (Max Lundberg, David Gustafsson). Two Greylag goslings with Canadas as foster parents were seen at Lillskärsudden (Vb) 16 July 2005 (Stefan Delin), while one Greylag gosling was adopted by a pair of Mute Swan at Dröstorpsmossen (Öl) in 2002 (Waldenström 2003). To obtain information about brood amalgamation in Sweden either pure luck or great devotion of the field observer is needed. Data presented here constitute of that reason very likely only a fraction of what really have occurred.

In Germany, there are records of eggs of both Mallard *Anas platyrhynchos* and Mute Swan in Greylag nests, of Greylag eggs in nests of Mute Swan, and of a Mute Swan pair successfully raising a Greylag Goose as well (Dittberner & Dittberner 1976, Hauff 1982, Plath 1985).

A strong pattern of natal female philopatry and male dispersal is the usual pattern in Anatidae (Greenwood 1980). In the Greylag Goose, the female rarely disperse more than 10 km, while the male can start to breed more than 1000 km from

the site of birth (Nilsson & Persson 2001). A similar pattern was found in a naturalised Greater Canada Goose population (Lessells 1985). One consequence of this sex-difference is that males can get problems in finding a female of their own species during a period of breeding range expansion. The Swedish Greylag Goose population is in such a phase since half a century (Svensson et al. 1999), during which time it has increased hundredfold in numbers. The fact that about 95% of all crosses between Greylag and Greater Canada Goose were found in flocks of the latter species should probably be viewed as most successful mixed pairs were made up of a male Greylag and female Canada. Field evidences are lacking however, as very few parent birds were ever sexed.

As the Greylag and the Greater Canada Goose get breeding ranges that are more or less overlapping, one can expect fewer crosses according to the "Best-Option-Hypothesis". At the same time, the chances of pre- and post-hatch brood amalgamation increase, for instance, by Greylag females laying eggs in Canada nests (Fabricius & Norgren 1987). So far, however, mixed broods of these two species have only been reported from three breeding sites in Sweden (see above).

Owing to problems of identification, second-generation hybrids are hardly ever reported except when seen together with both parents. In Sweden, there were reports of nine broods of seven different combinations of species, with a total of 28 young, and one possible young of an eighth combination as well (this study). These eight combinations represented, however, three different crossing possibilities, as six were back-crosses, one a cross between hybrids and one involved a third species. Most combinations of species proving to be fertile in this study were known to be so already half a century ago (Johnsgard 1960), the combination of Greylag Goose and Greater Canada Goose already by Bengt Berg (see Jansson 1984). In the latter combination of species, besides back-crosses with both parent species, also successful breeding of two hybrids was reported (Persson 1997). Moreover, one such hybrid was seen paired first to one of the parent species and later to the other one (*Snatter* 18(1993): 4). The only observation of a third-generation hybrid was, not surprisingly, recorded between Greylag and Swan Goose (cf. Lärn-Nilsson 1996).

Hybrids differ from individuals of the parental species not only in morphology but usually also in fertility and viability (Mayr 1970, Lack 1974). In general, the hybrids recorded in Sweden seemed to produce very few offspring. Several breeding at-

tempts did not result in any hatchlings, and in those producing fledglings, two thirds of all broods numbered only 1–2 young. Larger broods were only produced by pairs where one of the parents was a hybrid between a Greater Canada Goose and a Barnacle or Greylag Goose. When three species were involved, a total of three breeding attempts of three different species combinations resulted in only one hatchling, a bird that never fledged. A fourth three-species combination, a Siberian White-fronted Goose x Greylag Goose hybrid paired to a Lesser White-fronted Goose, was reported by Kolbe (1972).

Conservation implications

An increased incidence of hybridisation, similar to that at range expansion, often occurs during population declines (Randler 2006). This has implications for Red List species, in Sweden especially due to an increased occurrence of individuals of captive origin.

The only native species in Sweden that seemingly has been affected by hybridisation is the Greylag Goose, in which introgression of genetic material from the Swan Goose has taken place in Skåne. This process passed almost unnoticed however. Instead, it was the revelation that about 25% of the captive stock of Lesser White-fronted Geese, used in the Swedish re-establishing project, carried mitochondrial DNA of Siberian White-fronts that caught attention. Some geneticists are of the opinion that these haplotypes might be a relict from a distant shared ancestor (Kholodova & Severtsov 2002), but the general assumption is that this introgression took place by hybridisation in captivity (Ruokonen et al. 2004). However, it can very well be that it originates from a wild-caught individual, as such hybridisation occurs in the wild (see references above). One reason for geneticists not having found Siberian Whitefront genes in wild Lesser Whitefronts (Ruokonen et al. 2004, 2007) might be that such hybrids mainly associates with Siberian White-fronted Geese. The scientifically founded reasons to eradicate birds that have been released are of that reason quite weak. In either case, to obtain a more natural, though unknown, frequency of Siberian Whitefront DNA in the re-established Lesser Whitefront population, future releases in Sweden should be of pure-bred birds, and in large scale, by means of which the existing frequency can be diluted (cf. Andersson 2006, Andersson & Holmqvist 2007).

As hybrids produced by released Lesser White-

front males paired to Barnacle Geese seem to associate with Barnacles, they ought to have no negative impact on the re-established Lesser Whitefront population, even if there are indications that second-generation hybrids might have been produced (www.artportalen.se). A re-evaluation might be necessary, however, after the successful breeding of a Lesser Whitefront pair at Hörningsholm (Mpd) in 2006 (Allberg & Marklund 2006). Hybridisation with Siberian White-fronted Geese of captive origin, on the other hand, constitutes a real threat to both the re-established and the native population. Especially to the native one as it has declined to about 20 breeding pairs (Øien et al. 2007). An increasing number of Siberian Whitefronts has been recorded in Sweden in summer during the last few decades (Kampe-Persson & Lerner, in prep.), and hybridisation with different species has occurred in northern Fennoscandia (Birina 2005, this study). There is also one record of an individual paired to a Lesser White-fronted Goose staging in Lule lappmark in May 1991 (this study). A possible source of Siberian Whitefronts turning up in Fennoscandia during breeding time is the increasing naturalised population in the Netherlands, which numbered 400 pairs in 2005 (van der Jeugd et al. 2006). The first Dutch breeding was recorded in 1980, but it was a national ban on the use of live-decoys for hunting in 1998 that enhanced the establishment of a larger population. In 2005, there were also three pairs of Lesser White-fronted Goose in the Netherlands (van der Jeugd et al. 2006). There is also a report of one breeding mixed pair of Lesser White-fronted and Greylag Goose (Koffjberg et al. 2005).

The fact that the Lesser White-fronted Goose is *critically endangered* according to the Swedish Red List (Gärdenfors 2005), urges for action to prevent all kinds of devastating hybridisation. Also the EU Life Nature project "Conservation of the Lesser White-fronted Goose on European migration route" identifies hybridisation as a threat, however, in quite a different way: "An additional threat for the Fennoscandian LWfG is the possible hybridisation with the reintroduced and/or escaped captive LWfG (cf. IUCN guidelines for reintroduction and restocking). As shown by the recent genetic studies of the Finnish and Swedish stocks used or planned to be used in the reintroduction programmes, hybridisation with the White-fronted Goose (*Anser albifrons*) and Greylag Goose (*Anser anser*) has occurred several times during the captive history. The reintroduced birds of these captive stocks form also threat in the sense that the small

unpedigreed and ill managed captive populations might have accumulated deleterious mutations with untested effects in the wild. When introduced into small wild population, these alleles might become quickly fixed by genetic drift and accelerate the extinction of the wild Fennoscandian population. The present project will not, however, directly target the genetic threat.” (WWF Finland). The genetic studies referred to in the cited statement were made by Ruokonen et al. (2007). But, at the same time as the released birds are depicted as a threat, re-stocking is very likely the only measure by which the native population can be prevented from extinction within a near future. It is in the light of this, that projects other than the Life project shall be viewed (for a summary, see Hansson 2005).

Also for the Taiga Bean Goose, all factors negatively affecting the Swedish population (for a summary, see Kampe-Persson et al. 2005) ought to be limited to a minimum, due to the status of this taxon as *vulnerable* (Gårdenfors 2005). Evidently, hybridisation did not become one of these factors until quite recently (this study). But due to its small population size of only 800-1,250 breeding pairs (Leif Nilsson, pers. comm. to HKP), measures to prevent introgression of genetic material from closely related taxa, especially from birds of captive origin, should be considered for inclusion in a future conservation plan. Fauna falsification of that kind has occurred in the Swedish Greylag Goose population, by introgression of genes from the eastern subspecies *rubrirostris* (Kampe-Persson 2002), resulting in the occurrence of individuals with pink bills (Kampe-Persson 2003).

Regarding the third Red List species, the Red-breasted Goose, hybrids recorded in Sweden so far seem to have originated from the species' natural breeding grounds. Several summer sightings of free-flying Redbreasts with a suspected captive origin were done during the last years however (see, for example, Lerner 2004a). These birds might be a source for future hybridisation.

Both introduced and naturalised species have been found to hybridise with native geese, which calls for increased vigilance in regard to invasive species. After establishing itself in Great Britain (Sutherland & Allport 1991, Delany 1993, Brown & Grice 2005, Baker et al. 2006) and the Netherlands (Lensink 1996, 2002, van der Jeugd et al. 2006), the Egyptian Goose *Alopochen aegyptiacus* is now invading Sweden (Bengtsson 2007). Except for Common Shelduck, no reports of hybridisation with native species exist so far, only with introduced ones, such as Greater Canada Goose and

Ruddy Shelduck *Tadorna ferruginea* (Lensink 1996). In captivity, however, interbreeding has occurred between Egyptian and Greylag Goose (Gray 1958).

Some culling of hybrid geese is taking place on a regular basis, for instance in Skånes Djurpark (Staffan Åkeby; in litt.), and attempts are made to cull the hybridising Lesser White-fronted Geese of the Swedish re-establishment project (Lerner 2005a). One such bird, paired to a Barnacle Goose, was, for instance, shot at Hjälstaviken (Upl) 20 April 2007 (Karl-Gustav Sjölund et al.). That male, released in Swedish Lapland in 1997, had produced hybrids during the last 2–3 years, and should most likely have continued to do so (Bo Fagerström, in litt.). Another male, which never had shown any indication of hybridisation, was caught in 2005 (Åke Andersson, in litt.). Culling is also used locally to prevent naturalised populations from growing too large. It seems worth considering if culling should be used on a larger scale, as naturalised populations can serve as sources for both hybridisation and the spread of alien genes and behaviours. The more if situations similar to those in Great Britain (Delany 1993, Baker et al. 2006) and the Netherlands (Lensink 1996a, 1998, van Horssen & Lensink 2000, Ouweneel 2001, Sovon Vogelonderzoek Nederland 2002, van Roomen et al. 2003, van der Jeugd et al. 2006) are undesirable.

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References

- Aarvak, T. & Simonen, T. (eds.) 2004. *Fennoscandian White-fronted Goose conservation project. Report 2001–2003*. WWF Finland Report No 20 & Norwegian Ornithological Society, NOF Rapportserie report no. 1–2004, Helsinki & Klæbu.
- Allberg, B. & Marklund, I. 2006. Fjällgås – ny häckfågelart för landskapet. *Fåglar i Medelpad* 29(3/4): 19–21.
- Amcoff, M., Douhan, B., Edholm, M., Granberg, B. & Tjernberg, M. 1984. Fågelrapportereringen, Uppland 1983. *Fåglar i Uppland* 11: 103–142.
- Amcoff, M., Douhan, B., Edholm, M., Granberg, B., Tjernberg, M. & Westin, P. 1989. Fågelrapportereringen, Uppland 1988. *Fåglar i Uppland* 16: 127–167.
- Andersson, Å. 2004. The reintroduction of the Lesser White-

- fronted Goose in Swedish Lapland – a summary for 2000–2003. Pp. 51–52 in *Fennoscandian Lesser White-fronted Goose conservation project. Report 2001–2003*. (Aarvak, T. & Timonen, S., eds.). WWF Finland Report No 20 & Norwegian Ornithological Society, NOF Rapportserie report no. 1–2004, Helsinki & Klæbu.
- Andersson, Å. 2006. Fjällgäss i blåsväder. *Svensk Jakt* 144: 382–383.
- Andersson, Å. & Holmqvist, N. 2007. SOF:s syn på fjällgässen och Projekt Fjällgås. *Vår Fågelvärld* 66(3): 38.
- Axelsson, P. 1967. Bird observations from NE Skåne in 1965 (56°N). *Vår Fågelvärld* 26: 174–180. (Swedish with English summary).
- Baker, H., Stroud, D.A., Aebischer, N.J., Cranswick, P.A., Gregory, R.D., McSorley, C.A., Noble, D.G. & Rehfish, M.M. 2006. Population estimates of birds in Great Britain and the United Kingdom. *British Birds* 99: 25–44.
- Bauer, K.M. & Glutz von Blotzheim, U.N. 1968. *Handbuch der Vögel Mitteleuropas*. Band 2. Akademische Verlagsgesellschaft, Frankfurt am Main.
- Beauchamp, G. 1998. The relationship between intra- and interspecific brood amalgamation in waterfowl. *Condor* 100: 153–162.
- Bengtsson, K. 2007. Nilgåsen i Skåne och övriga världen. *Anser* 46: 41–46.
- Berg, B. 1930. *De liefdesgeschiedenis van een wilde gans*. H P Leopold N V, Den Haag.
- Berg, B. 1937. *Mina försök med vildgäss*. P.A. Norstedt & Söners Förlag, Stockholm.
- Bergh, L.M.J. van den 2004. Het voorkomen van Taiga- en Toendarietganzen in Fryslân sinds 1970. *Twirre* 15(3): 69–74.
- Birina, U. 2005. Blandningspar av kortnebbgås og tundragås med hekkforsøk i Lofoten. *Vår Fuglefauna* 28: 158–160.
- Bolund, L. 1964. Hybrids between the Canada Goose (*Branta canadensis*) and the Gray Lag Goose (*Anser anser*) at Norrköping. *Vår Fågelvärld* 23: 326. (Swedish with English summary).
- Borg, H. 1962. Hybrid between Grey Lag Goose and Canada Goose in the province of Västmanland. *Vår Fågelvärld* 21: 305–307. (Swedish with English summary).
- Brown, A. & Grice, P. 2005. *Birds in England*. T. & A.D. Poyser, London.
- Bruns, H.A. 1982. Über das Auftreten von nichtheimischen Wildgansarten und Artbastarden am Dümmer (Niedersachsen) seit Beginn der Grauganseinbürgerung. *Seevögel* 3: 92–93.
- Bruns, H.A. 1985. Von nichtheimischen Wildgänsen und Artbastarden am Dümmer (Niedersachsen). *Seevögel* 6: 176–177.
- Carlsson, K., Elf, A., Gustafsson, J., Linde, L. & Sahlin, F. 2006. Fågelobservationer i Östergötland 2005. *Vingspegeln* 25: 18–40.
- Cate, C. ten 1985. On sex differences in sexual imprinting. *Animal Behaviour* 33: 1310–1317.
- Cramp, S. 1977. *Handbook of the Birds of Europe, the Middle East and North Africa*. The Birds of the Western Palearctic. Volume 1. Ostrich to Ducks. Oxford University Press, Oxford.
- Cronert, H. & Svensson, Å. 1991. *Nordostskånska skärgårdskustens fåglar* – med resultat från kustinventeringen 1983 och 1984. Spoven, supplement 2, Nordöstra Skånes Fågelklubb & Länsstyrelsen i Kristianstads län, Kristianstad.
- Curry-Lindahl, K. (ed.) 1959. *Våra Fåglar i Norden*. Vol. I. Bokförlaget Natur och Kultur, Stockholm.
- Darwin, C. 1859. *On the Origin of Species by Means of Natural Selection, or The Preservation of Favoured Races in the Struggle for Life*. Murray, London.
- Darwin, C. 1880. Fertility of hybrids from the common and chinese goose. *Nature* 21: 207.
- Delany, S. 1993. Introduced and escaped geese in Britain in summer 1991. *British Birds* 86: 591–599.
- Dittberner, H. & Dittberner, W. 1976. Ein Mischgelege von Höckerschwan (*Cygnus olor*) and Graugans (*Anser anser*). *Beiträge zur Vogelkunde* 22: 367–368.
- Eadie, J.McA., Kehoe, F.P. & Nudds, T.D. 1988. Pre-hatch and post-hatch brood amalgamation in North American Anatidae: a review of hypotheses. *Canadian Journal of Zoology* 66: 1709–1721.
- Edholm, M. 1987. Övåntad häckningsframgång hos omaka (?) gåspar. *Fåglar i Uppland* 14: 189.
- Elleström, O., Green, M., Larsson, H., Malmhagen, B., Ottvall, R., Rellmar, M. & Råberg, L. 1996. *Fåglar i Skåne 1995*. Anser, supplement 39. Lund.
- Elmfors, A. 1980. Rapport från kustinventeringen 1980. *Information från Nordöstra Skånes Fågelklubb*. 4: 49–52.
- Engström, P. 1996. Det var inte som jag trodde – bara delvis. *Fåglar i Stockholmstrakten* 25: 213–214.
- Eriksson, U. 1982. Grågäsen i Västmanland. *Fåglar i Västmanland*. 13: 56–62.
- Essen, L. von 1982. Försöksverksamhet med uppfödning och utplantering av sädgås. Pp. 105–108 in *De svenska gässen* (Svensson, S., ed.). *Vår Fågelvärld*, supplement 9, Stockholm.
- Fabricius, E. 1983. *The Canada Goose in Sweden*. PM 1678. Statens Naturvårdsverk, Stockholm. (Swedish with English summary).
- Fabricius, E. 1991. Interspecific Mate Choice Following Cross-fostering in a Mixed Colony of Greylag Geese (*Anser anser*) and Canada Geese (*Branta canadensis*). A Study on Development and Persistence of Species Preferences. *Ethology* 88: 287–296.
- Fabricius, E., Bylin, A., Fernö, A. & Radesäter, T. 1974. Intra- and interspecific territorialism in mixed colonies of the Canada Goose *Branta canadensis* and the Greylag Goose *Anser anser*. *Ornis Scandinavica* 5: 25–35.
- Fabricius, E. & Norgren, H. 1987. *Lär känna Kanadagäsen*. Svenska jägareförbundet, Stockholm.
- Fredriksson, R. & Tjernberg, M. (eds.) 1996. *Upplands fåglar – fåglar, människor och landskap genom 300 år*. Fåglar i Uppland, supplement 2, Uppsala.
- Ganter, B., Larsson, K., Syroechkovsky, E.V., Litvin, K.E., Leito, A. & Madsen, J. 1999. Barnacle Goose *Branta leucopsis*: Russia/Baltic. Pp. 270–283 in *Goose Populations of the Western Palearctic*. (Madsen, J., Cracknell, G. & Fox, T., eds.). Wetlands International Publ. No. 48. Wetlands International & National Environmental Research Institute, Wageningen & Rønde.
- Gjershaug, J.O., Thingstad, P.G., Eldøy, S. & Byrkjeland, S. (eds.) 1994. *Norsk fugleatlas*. Norsk Ornitologisk Forening, Klæbu.
- Gray, A.P. 1958. *Bird Hybrids*. A Check-list with Bibliography. Commonwealth Agricultural Bureaux, Farnham Royal, Buck.

- Green, A. & Hughes, B. 1996. Action plan for the White-headed Duck (*Oxyura leucocephala*) in Europe. Pp. 119–145 in *Globally threatened birds in Europe* (Heredia, B., Rose, L. & Painter, M., eds.). Council of Europe, Strasbourg.
- Green, M., Larsson, H., Malmhagen, B., Ottvall, R., Rellmar, M., Råberg, L. & Segergren, J. 1997. *Fåglar i Skåne 1996*. Anser, supplement 40. Lund.
- Greenwood, P.J. 1980. Mating systems, philopatry and dispersal in birds and mammals. *Animal Behaviour* 28: 1140–1162.
- Gustad, J.R. 1992. Fugler i Norge 1991. Rapport fra Norsk Faunakomite for Fugl (NFKF). *Vår Fuglefauna* 15: 209–232.
- Gustad, J.R. 1993. Fugler i Norge 1992. Rapport fra Norsk Faunakomite for Fugl (NFKF). *Vår Fuglefauna* 16: 227–248.
- Gärdenfors, U. (ed.) 2005. *Rödlistade arter i Sverige 2005 – The 2005 Red List of Swedish Species*. ArtDatabanken, SLU, Uppsala.
- Hansson, P. 2005. Kan fjällgäsen, *Anser erythropus*, någonsin komma tillbaka till Västerbotten? *Fåglar i Västerbotten* 30: 2–8.
- Hauff, P. 1982. Bestandsentwicklung und Brutbiologie der Graugans, *Anser anser*, im NSG Kuhlraeder Moor und Röggeleiner See. *Beiträge zur Vogelkunde* 28: 48–58.
- Holmberg, T. 1986. Projekt sädgås. *Fåglar i Jämtland-Härjedalen* 6(3): 8–9.
- Horsssen, P. van & Lensink, R. 2000. A rapid increase of the Bar-headed Goose *Anser indicus* in the Netherlands. *Limosa* 73: 97–104. (Dutch with English summary).
- Hubbs, C.L. 1955. Hybridization between Fish Species in Nature. *Systematic Zoology* 4: 1–20.
- Hughes, B. 1996. The Ruddy Duck (*Oxyura jamaicensis*) in Europe and the threat to the White-headed Duck (*Oxyura leucocephala*): a review, an evaluation and conservation actions. *Gibier Faune Sauvage, Game Wildlife* 13: 1127–1141.
- Hughes, B., Robinson, J.A., Green, A.J., Li, Z.W.D. & Mundkur, T. (Compilers) 2006. *International Single Species Action Plan for the Conservation of the White-headed Duck Oxyura leucocephala*. CMS Technical Series No. 13 & AEW Technical Series No. 8. Bonn.
- Husby, M. 1994. Kortnebbgås hekket i lag med kanadagås i Hammervatnet i 1994. *Trøndersk Natur* 21: 78.
- Huyskens, P.R.G. 1986. Het Europese Rietganzenprobleem *Anser fabalis*. *Oriolus* 52: 105–256. (Flemish with English summary).
- Huyskens, P. 1999. *The Taiga Bean Goose (Anser fabalis): a species that needs world-wide protection*. Report, 77 pp. Kapellen.
- Högström, S. 1980. Fåglar på Gotland 1979. *Bläcku* 6: 3–14.
- Irgens, M. 2004. Første hekkefunns av kortnebbgås på det norske fastlandet. *Vår Fuglefauna* 27: 110–111.
- IUCN 2006. *2006 IUCN Red List of Threatened Species*. <www.iucnredlist.org>. Downloaded on 25 March 2007.
- Jansson, T. 1984. Kanadagås x Grågås = ?? *Calidris* 13: 38–40.
- Johansen, H. 1962. Saatgänse aus Winterquartieren in Ungarn. *Aquila* 67–68: 36–38.
- Johansson, H. 1968. Kanadagäsen som övervintrare i Ystadtrakten. *Meddelanden från Skånes Ornitologiska Förening* 7: 13.
- Johnsgard, P.A. 1960. Hybridization in the Anatidae and its taxonomic implications. *Condor* 62: 25–33.
- Jonasson, L. 1966. Bastard mellan kanadagås och grågås. *Meddelanden från Skånes Ornitologiska Förening* 5: 78–79.
- Jonsson, L. 1979. A hybrid between Barnacle and Red-breasted goose observed on southern Gotland. *Bläcku* 5: 14–17. (Swedish with English summary).
- Kampe-Persson, H. 2002. *Anser anser* Greylag Goose. *BWP Update* 4: 181–216.
- Kampe-Persson, H. 2003. Variation in bill colour among Greylag Geese *Anser anser* breeding in south-west Scania. *Ornis Svecica* 13: 63–66.
- Kampe-Persson, H. 2004. Is Doñana of importance for the Lesser White-fronted Goose *Anser erythropus*? *Anuario Ornitológico de Doñana* 1: 217–225.
- Kampe-Persson, H. 2007. Hur väl kan en arts antalsmässiga förekomst beskrivas genom utnyttjande av rapporteringen på Svalan? *Fåglar i Blekinge* 43: 93–97.
- Kampe-Persson, H., Bildström, L. & Bildström, M. 2005. Can nesting competition with Whooper Swan *Cygnus cygnus* cause a decline of the Swedish Taiga Goose *Anser fabalis fabalis* population? *Ornis Svecica* 15: 119–121. (Swedish with English summary).
- Kear, J. 1990. *Man and Wildfowl*. T. & A.D. Poyser, London.
- Kholodova, M.V. & Severtsov, A.N. 2002. *Analyses of the captive population of the Lesser White-fronted Geese*. Report 2001/2002. Institute of Ecology and Evolution, RAS, Moscow.
- Klafs, G. & Stübs, J. 1987. *Die Vogelwelt Mecklenburgs*. Avifauna der Deutschen Demokratischen Republik. Band 1. AULA-Verlag, Wiesbaden.
- Koffijberg, K., Cottaar, F. & van der Jeugd, H. 2005. *Pleisterplaatsen van Dwergganzen Anser erythropus in Nederland*. SOVON-informatierapport 2005/06. SOVON Vogelonderzoek Nederland, Beek-Ubbergen. (Dutch with English summary).
- Kolbe, H. 1972. *Die Entenvögel der Welt*. Neumann-Neudamm, Melsungen.
- Kreutzkamp, I. 1996. Die Graugans (*Anser anser*) im Hamburg und Umgebung. *Hamburger Avifaunistische Beiträge* 28: 129–158.
- Kyrk, C. 1987. Hybrid vitkindad gås x fjällgås. *Fåglar i Stockholmstrakten* 16: 16–17.
- Lack, D. 1974. *Evolution Illustrated by Waterfowl*. Blackwell Scientific Publications, Oxford.
- Lebret, T. 1983. Bastaarden van Brandgans *Branta leucopsis* x Sneeuwvangans *Anser caerulescens*. *Limosa* 56: 18–19. (Dutch with English summary).
- Lee, H.F. van der & Ouweneel, G.L. 1976. Een waarschinlijke hybride tussen Roodhalsgans *Branta ruficollis* en Brandgans *Branta leucopsis*. *Limosa* 49: 213–215.
- Lennerstedt, R. 1962. The Bean Geese (*Anser fabalis*) in northern Halland (57°25'N, 12°E). *Vår Fågelvärld* 21: 174–181. (Swedish with English summary).
- Lensink, R. 1996a. The rise of exotic bird species in the Dutch avifauna; past, present and future. *Limosa* 69: 103–130. (Dutch with English summary).
- Lensink, R. 1996b. Vreemde vogels in de Nederlandse avifauna: verleden, heden en wat voor en toekomst. *Het Vogeljaar* 44: 145–164.
- Lensink, R. 1998. Does the Domestic Goose *Anser anser*

- forma *domestica*, as a descendant of the Greylag Goose *Anser anser*, live its own life in The Netherlands? *Limosa* 71: 49–56. (Dutch with English summary).
- Lensink, R. 2002. Nijlgans *Alopochen aegyptiacus*. Pp. 108–109 in *Atlas van de Nederlandse Broedvogels 1998–2000*. Nederlandse Fauna 5. (SOVON Vogelonderzoek Nederland, ed.). Nationaal Natuurhistorisch Museum Naturalis, Koninklijke Nederlandse Natuurhistorische Vereniging Uitgeverij & European Invertebrate Survey-Nederland, Leiden. (Dutch with English summary).
- Lerner, H. 2004a. Rödhsalsad gås *Branta ruficollis*. P. 106 in *Fågelåret 2003*. Sveriges Ornitologiska Förening, Stockholm.
- Lerner, H. 2005a. Fynd av några hybridgäss 2004. Pp. 48–51 in *Fågelåret 2004*. Sveriges Ornitologiska Förening, Stockholm.
- Lerner, H. 2005b. Nilgås *Alopochen aegyptica*. Pp. 64–65 in *Fågelåret 2004*. Sveriges Ornitologiska Förening.
- Lerner, H. & Kampe-Persson, H. 2006. Fynd av hybridgäss. Pp. 160–163 in *Fågelåret 2005*. Sveriges Ornitologiska Förening, Stockholm.
- Lessells, C.M. 1985. Natal and breeding dispersal of Canada geese *Branta canadensis*. *Ibis* 127: 31–41.
- Liebherr, H. & Rutschke, E. 1993. Ergebnisse morphometrischer Untersuchungen an Saatgänsen – *Anser fabalis*. *Ornithologische Mitteilungen* 45: 297–304.
- Litzbarski, H. 1974. Taxonomische und biometrische Untersuchungen an der Saatgans *Anser fabalis* (Latham 1787). *Beiträge zur Vogelkunde* 20: 391–411.
- Lärn-Nilsson, J. 1996. *Gåsen – gudarnas fågel*. LTs förlag, Stockholm.
- Madsen, J., Cracknell, G. & Fox, T. (eds) 1999. *Goose populations of the Western Palearctic*. Wetlands International Publ. No. 48. Wetlands International & National Environmental Research Institute, Wageningen & Rønde.
- Malmstigen, J.-E. 1980. Gåshybrid i Finnåkerssjön. *Fåglar i Västmanland* 11: 86.
- Markgren, G. 1963. Migrating and wintering geese in southern Sweden. Ecology and Behaviour Studies. *Acta Vertebratica* 2: 297–418.
- Markkola, J., Timonen, S. & Nieminen, P. 1999. The Finnish breeding and restocking project of the Lesser White-fronted Goose: results and the current situation in 1998. Pp. 47–50 in *Fennoscandian Lesser White-fronted Goose conservation project. Annual report 1998*. (Tolvanen, P., Øien, I.J. & Ruokolainen, K., eds.). WWF Finland Report 10 & Norwegian Ornithological Society, NOF Rapportserie Report no. 1–1999, Helsinki & Klæbu.
- Mayr, E. 1970. *Populations, Species, and Evolution*. Harvard University Press, Cambridge.
- McCarthy, E.M. 2006. *Handbook of Avian Hybrids of the World*. Oxford University Press, Oxford.
- Messer, C.E. 1999. *Norrköpingstraktens fåglar*: Report, 105 pp. Fågel föreningen & Naturskydds föreningen, Norrköping.
- Messer, C. 2005. En trolig hybrid mellan fjällgås och vitkindad gås. *Fåglar i Norrköpingstrakten* 26(3): 18.
- Moreno Gaztambide, J.I. 1993. Una pareja de ansares cria por primera vez en Navarra. *Federcaza* 96: 39–40.
- Müller, A. 2001. Rättselvogel. *Limicola* 15: 228–230.
- Muñoz-Pomer, V. 2006. *Genética de poblaciones e hibridación de la malvasia cabeciblanca, Oxyura leucocephala, y la malvasia canela, Oxyura jamaicensis*. Dissertation. Universidad de Sevilla.
- Nagy, E. 1950. Über Gänsebastarde. Pp. 256–266 in *Syllegomena Biologica, Festschrift 80. Geburtstag Otto Kleinschmidt*. Akademische Verlagsgesellschaft Geest & Portig, Leipzig.
- Nilsson, L. 2006. Internationella gåsinventeringar i Sverige. Pp. 35–49 in *Fågelåret 2005* (SOF). Vår Fågelvärld, Supplement 45, Stockholm.
- Nilsson, L. & Persson, H. 2001. Natal and breeding dispersal in the Baltic Greylag Goose *Anser anser*. *Wildfowl* 52: 21–30.
- Nilsson, T. 1983. Dementi om två fynd av fjällgås (*Anser erythropus*). *Fåglar i Blekinge* 19: XXIII–XXIV.
- Nilsson, T. 1984. Häckning av vitkindad gås (*Branta leucopsis*) i Blekinge. *Fåglar i Blekinge* 20: 49–50.
- Nilsson, T. 2000. *Fåglar i Västblekinge*. Fåglar i Blekinge, supplement 2000:1. Västblekinges Ornitologiska Förening, Karlshamn.
- Nilsson, T. & Lundgren, U. 1993. *Blekinges fåglar*. Fåglar i Blekinge, supplement 1993:1. Karlskrona.
- Nord, I. 1964. Hybrids between the Canada Goose (*Branta canadensis*) and the Gray Lag Goose (*Anser anser*) at Norrköping. *Vår Fågelvärld* 23: 326. (Swedish with English summary).
- Nordöstra Skånes rapportkommitté 1968. Bird report from the eastern part of Skåne in 1966. *Vår Fågelvärld* 27: 265–269. (Swedish with English summary).
- Ogilvie, M.A. 1978. *Wild Geese*. T. & A.D. Poyser, Berkhamsted.
- Olsson, N. 1954. *Våra fjäderfän*. LTs förlag, Stockholm.
- Ouweneel, G.L. 2001. Rapid increase of breeding Barnacle Geese *Branta leucopsis* in the Delta area, SW Netherlands. *Limosa* 74: 137–146. (Dutch with English summary).
- Owen, M. 1980. *Wild Geese of the world*. B.T. Batsford, London.
- Palacios, J. & Rodríguez, M. 1999. *Guía de Fauna de la Reserva "Las Lagunas de Villafafila"*. Monografías de las Red de Espacios Naturales de Castilla y León. Junta de Castilla y León, Consejería de Medio Ambiente y Ordenación del Territorio, Dirección General del Medio Natural, Valladolid.
- Panov, E.N. 1989. *Hybridization and ethological isolation in birds*. Nauka, Moscow. (In Russian).
- Persson, H. 1995a. Hybridization between Greylag Goose *Anser anser* and Canada Goose *Branta canadensis* and a comparison with White-headed Duck *Oxyura leucocephala*. *Anser* 34: 51–53. (Swedish with English summary).
- Persson, H. 1995b. Förekomsten av tundrasädgås i Blekinge. *Fåglar i Blekinge* 31: 123–130.
- Persson, H. 1997a. Breeding of the Barnacle Goose *Branta leucopsis* in Skåne, 1986–1996. *Anser* 36: 11–15. (Swedish with English summary).
- Persson, H. 1997b. Occurrence of the Tundra Bean Goose *Anser serrirostris rossicus* in Scania, 1974–1996. *Anser* 36: 179–184. (Swedish with English summary).
- Persson, H. & Urdiales, C. 1997. Amerikansk kopparand – en ovälkommen nykomling. *Vår Fågelvärld*. 56(6): 7–11.
- Plath, L. 1985. Ein Mischgelege von Graugans (*Anser anser*) und Höckerschwan (*Cygnus olor*). *Beiträge zur Vogelkunde* 31: 170–171.
- Randler, C. 2000. Hybrid wildfowl (Anseriformes) in Western Central Europe – distribution, occurrence and causes. *Ökologie der Vögel / Ecology of Birds* 22: 1–106. (Ger-

- man with English summary).
- Randler, C. 2001. Field identification of hybrid waterfowl – Geese. *Alula* 7: 42–48.
- Randler, C. 2002. Avian hybridization, mixed pairing and female choice. *Animal Behaviour* 63: 103–119.
- Randler, C. 2004. Frequency of bird hybrids: does detectability make all the difference? *Journal of Ornithology* 145: 123–128.
- Randler, C. 2005. Do forced extrapair copulations and interspecific brood amalgamation facilitate natural hybridisation in wildfowl? *Behaviour* 142: 477–488.
- Randler, C. 2006. Behavioural and ecological correlates of natural hybridization in birds. *Ibis* 148: 459–467.
- Rodríguez, M. & Palacios, J. 1993. *Guía de la Reserva de "Las Lagunas de Villafáfila"*. Monografías de las Red de Espacios Naturales de Castilla y León. Junta de Castilla y León, Consejería de Medio Ambiente y Ordenación del Territorio, Dirección General del Medio Natural, Valladolid.
- Rogers, M.J. 1979. Report on rare birds in Great Britain in 1978. *British Birds* 72: 503–549.
- Roomen, M.W.J. van, van Winden, E.A.J., Köffijberg, K., Kleefstra, R., Ottens, G., Voslamber, B. & SOVON Ganzen- en zwanenwerkgroep. 2003. *Waternvogels in Nederland in 2001/2002*. SOVON-monitoringrapport 2004/01. RIZA-rapport BM 04.01. SOVON Vogelonderzoek Nederland, Beek-Ubbergen.
- Rowell, H.E., Ward, R.M., Hall, C. & Cranswick, P.A. 2004. *The Naturalised Goose Survey 2000*. The Wildfowl & Wetlands Trust, Slimbridge.
- Rundström, U. 1992. Häckande och rastande våtmarksarter vid Stensjön 1991. *Fåglar i Sörmland*. 25: 23–27.
- Ruokonen, M. 2000. Genetic composition of the captive Lesser White-fronted Goose population. Pp. 54–56 in *Fennoscandian Lesser White-fronted Goose conservation project. Annual report 1999* (Tolvanen, P., Øien, I.J. & Ruokolainen, K., eds.). WWF Finland Report No 12 & Norwegian Ornithological Society, NOF Rapportserie Report no. 1–2000, Helsinki & Klæbu.
- Ruokonen, M. 2001. *Phylogeography and conservation genetics of the lesser white-fronted goose* (*Anser erythropus*). Dissertation. Department of Biology, University of Oulu.
- Ruokonen, M., Kvist, L. & Lumme, J. 2000. Close relatedness between mitochondrial DNA from seven *Anser* goose species. *Journal of Evolutionary Biology* 13: 532–540.
- Ruokonen, M., Kvist, L., Aarvak, T., Markkola, J., Morozov, V.V., Øien, I.J., Syroechkovsky Jr., E.E., Tolvanen, P. & Lumme, J. 2004. Population genetic structure and conservation of the lesser white-fronted goose (*Anser erythropus*). *Conservation Genetics* 5: 501–512.
- Ruokonen, M., Andersson, A.-C. & Tegelström, H. 2007. Using historical captive stocks in conservation. The case of the lesser white-fronted goose. *Conservation Genetics* 8: 197–207.
- Rutschke, E. 1983a. *Die Vogelwelt Brandenburgs*. Avifauna der Deutschen Demokratischen Republik. Band 2. VEB Gustav Fischer Verlag, Jena.
- Rutschke, E. 1983b. Zur Bestandsentwicklung der Wildgänse Europas. *Der Falke* 30: 344–349.
- Rutschke, E. 1997. *Wildgänse*. Parey Buchverlag, Berlin.
- Rutschke, E. & Liebherr, H. 1996. Neue Erkenntnisse über die Wanderungen der Saatgans (*Anser fabalis* Latham). *Beiträge zur Jagd- und Wildforschung* 21: 337–346. (German with English summary).
- Sangster, G., Hazevoet, C.J., van den Berg, A.B., Roselaar, C.S. & Sluys, R. 1999. Dutch avifaunal list: species concepts, taxonomic instability, and taxonomic changes in 1977–1998. *Ardea* 87: 139–165.
- Sangster, G., van den Berg, A.B., van Loon, A.J. & Roselaar, C.S. 2003. Dutch avifaunal list: taxonomic changes in 1999–2003. *Ardea* 91: 279–286.
- Scherer, S. & Hilsberg, T. 1982. Hybridization and relationships in the Anatidae – a taxonomic and evolutionary consideration. *Journal für Ornithologie* 123: 357–380. (German with English summary).
- Scott, P. & Boyd, H. 1956. Lesser White-fronted Geese in Gloucestershire, 1956. *British Birds* 49: 228.
- Shackleton, K. 1956. Apparent hybrid Lesser White-fronted x White-fronted Goose in Hampshire and Sussex. *British Birds* 49: 229.
- Sibley, D. 1994. A Guide to Finding and Identifying Hybrid Birds. *Birding* 26: 162–177.
- Sjöberg, G. 1990. Hybridgås häckande i Ångermanland. *Gråspetten* 10: 13–15.
- Smith, F. R. 1970. Report on rare birds in Great Britain in 1969 (with 1960 and 1968 additions). *British Birds* 63: 267–293.
- Smith, G.C., Henderson, I.S. & Robertson, P.A. 2005. A model of ruddy duck *Oxyura jamaicensis* eradication for the UK. *Journal of Applied Ecology* 42: 546–555.
- SOF. 2002. *Sveriges fåglar*. 3rd edition. Stockholm.
- SOF. 2006. *Fågelåret 2005*. Stockholm.
- SOVON Vogelonderzoek Nederland 2002. *Atlas van de Nederlandse Broedvogels 1998–2000*. Nederlandse Fauna 5. Nationaal Natuurhistorisch Museum Naturalis, Koninklijke Nederlandse Natuurhistorische Vereniging Uitgeverij & European Invertebrate Survey-Nederland, Leiden.
- Sutherland, W.J. & Allport, G. 1991. The distribution and ecology of naturalized Egyptian Geese *Alopochen aegyptiaca* in Britain. *Bird Study* 38: 128–134.
- Svenska Jägareförbundet. 2006. *Viltövernakningen. Årsrapport 2005/2006*. <www.jagareforbundet.se>. Downloaded 15 June 2007.
- Svensson, S., Svensson, M. & Tjernberg, M. 1999. *Svensk fågelatlas. Vår Fågelvärld*, supplement 31, Stockholm.
- Söderholm, S. 2005a. Mixed brood of Greylag Goose *Anser anser* and Canada Goose *Branta canadensis* – nest parasitism or brood amalgamation? *Ornis Svecica* 15: 48–51. (Swedish with English summary).
- Söderholm, S. 2005b. Greylag Goose *Anser anser* as nest parasite of Canada Goose *Branta canadensis*. *Ornis Svecica* 15: 173–174. (Swedish with English summary).
- Sørhuus, T. 2005. Hybrid gås ved Bodsjön Jämtland 14 august 2005. <www.nofnt.no/trond/fugl/Jamtland/hybrid/index.htm>.
- Tegelström, H., Ruokonen, M. & Löfgren, S. 2001. The genetic status of the captive Lesser White-fronted Geese used for breeding and reintroduction in Sweden and Finland. Pp. 37–39 in *Fennoscandian Lesser White-fronted Goose conservation project. Annual report 2000*. (Tolvanen, P., Øien, I.J. & Ruokolainen, K., eds.). WWF Finland Report 13 & Norwegian Ornithological Society, NOF Rapportserie Report no. 1–2001, Helsinki & Klæbu.
- Torres, J.A. 2001. Se duplica en un año la población española de malvasía cabeciblanca. *Quercus* 182: 10.

- Trauger, D.L., Dzubin, A. & Ryder, J.P. 1971. White geese intermediate between Ross' Geese and Lesser Snow Geese. *Auk* 88: 856–875.
- Thorin, M. 1981. Fågelobservationer 1981. *Aegolius* 7: 5–16.
- Tjernberg, M. 1987. Förmodad hybrid – säd- x spetsbergsgås. *Fåglar i Uppland* 14: 85–86.
- Tveit, G. 1984. Autumn migration, wintering areas and survival of Bean Geese *Anser fabalis* marked on the moulting grounds in Finnmark, north Norway. *Swedish Wildlife Research* 13(1): 73–82.
- Urdiales, C. & Pereira, P. 1993. *Identification key of O. jamaicensis, O. leucocephala and their hybrids*. Instituto Nacional para la Conservación de la Naturaleza, Madrid.
- Van Impe, J. 1982. The Lesser White-fronted Goose in the south of the province of Zeeland (Netherlands). *Veldornitologisch Tijdschrift* 5: 130–140. (Dutch with English summary).
- Voous, K.H. & Wattel, J. 1967. Probable wild hybrid White-fronted x Lesser White-fronted Goose. *Limosa* 40: 9–11. (Dutch with English summary).
- Voslamber, B. 2002. Kogans *Anser albifrons*. Pp. 96–97 in *Atlas van de Nederlandse Broedvogels 1998–2000*. Nederlands Fauna 5. (SOVON Vogelonderzoek Nederland, ed.). Nationaal Natuurhistorisch Museum Naturalis, Koninklijke Nederlandse Natuurhistorische Vereniging Uitgeverij & European Invertebrate Survey-Nederland, Leiden.
- Waldenström, A. 2003. Inventering av Dröstorpsmossen 2002. *Calidris* 32: 26–31.
- Wallin, M. 1995. De öländska gässen – en översikt. *Calidris* 24: 77–83.
- Westring, R. 1984. Besynnerliga gäss i Nävelsjö. *Fåglar i Vetlandatrakten* 16: 59–60.
- Øien, I.J., Aarvak, T. & Ekker, M. 2007. Imre er død – leve dvergås! *Vår Fuglefauna* 30: 26–28.
- Österblad, P. 1987. Fjällgås x dvärgkanadagås. *Fåglar i Blekinge* 23: 67.

Sammanfattning

Hybridisering mellan arter inom samma släkte är vanligt hos andfåglar, men även hybridisering mellan arter från olika släkten förekommer. Bland gässen kan i princip varje artkombination förekomma mellan släktena *Anser* och *Branta*. Få skattningar av antalet hybrider i det vilda har gjorts och den här artikeln är den första heltäckande för Sverige. Studien ger grundläggande data kring alla de fynd av blandpar och hybridgäss som har noterats i Sverige fram till och med augusti 2007. Typer av hybrider, antal, trender och ursprung diskuteras. Extra stor vikt har fäst vid de rödlistade arterna fjällgås, sädgås och rödhalsad gås.

Rapporten bygger på observationer publicerade i nationella, regionala och lokala tidskrifter och rapporter, inlagda i Svalan, gjorda av författarna (HKP och HL) eller av andra som sänt sina observationer

till författarna. Ett problem med observationer av hybrider är att alla fågelskådare inte noterar och rapporterar dessa. Ett annat att ett flertal lokala publikationer är svårfunna. Majoriteten av observationerna i denna rapport är inte granskade och korrigerade utan bygger på observatörens angivande av föräldrafåglar. Nomenklaturen i rapporten följer rekommendationer gjorda av Commissie Systematiek Nederlandse Avifauna (Sangster et al. 1999, 2003), vilket innebär att sädgåskomplexet delats upp i taigasädgås *Anser fabalis* och tundrasädgås *Anser serrirostris*, kanadagåskomplexet i kanadagås *Branta canadensis* och dvärgkanadagås *Branta hutchinsii* samt prutgås i mörkbukig *Branta bernicla*, ljusbukig *Branta hrota* och svartbukig prutgås *Branta nigricans*.

Av samtliga i Sverige förekommande gäss har 17 arter varit involverade som föräldrar till hybrider (Tabell 1, Appendix). Bland hybridtyperna var vitkindad gås den mest representerade (tio typer), följt av grågås (nio), kanadagås (åtta) samt bläsgås och snögås (sju vardera). Vissa hybridtyper noterades redan under perioden 1918–1930-talet (bläsgås x snögås, bläsgås x taigasädgås, bläsgås x strippgås och grågås x kanadagås; Tabell 2). De flesta av de andra typerna noterades först under de sista 30 åren (Tabell 3). Andragenerationshybrider har rapporterats sen mitten på 1980-talet. Antalet hybrider verkar ha ökat i Sverige under det senaste halvsekle (Tabell 4). Den i antal vanligaste hybridtypen är grågås x kanadagås och den näst vanligaste kanadagås x vitkindad gås (Tabell 5).

Hybridgässen har det senaste halvsekle ökat i antal i Sverige. Huruvida detta beror på ökande populationer, förändringar i förekomsten av antalet tama och halvilda fåglar, en ökande förekomst på sydliga breddgrader av nordliga arter eller en högre rapporteringsfrekvens behöver utredas närmare.

Resultaten från den här studien stöder åtminstone två av de teorier som framlagts för att förklara hybridisering inom andfågeln, nämligen ”Best-Option-Hypothesis” och ”Inter-specific mate choice following false imprinting”.

I populationer som minskar ökar risken för hybridisering. Bland de rödlistade gässen, fjällgås, taigasädgås och rödhalsad gås, har hybrider med andra arter observerats, vilket är oroande. Det är av yttersta vikt att hänsyn tas till risken för hybridisering när åtgärdsprogram för hotade arter upprättas eller revideras. Avlivande av hybrider och individer som uppträder i blandpar bör också i vissa fall övervägas.

Appendix

Anser albifrons x *Anser anser*

Pairs were seen at Getterön (HI) 19 April 1962 (Uno Unger), Gustavsvik (Vrm) 5 May 2001 (Torbjörn Mossberg), Hornborgasjön (Vg) 21 April 2003 and 2–8 April 2004 (Albin Thorsson, Clas Hermansson), Ölmeviken (Vrm) 11 May 2003 (Per Gustafsson, Roger Johansson), Juviken (Ång) 3 April 2005 (Leif Johansson), Åsunden (Vg) 9 May 2005 (Jan Larsson), Torslandaviken (Boh) 28 June–18 July 2006 (Göran Gustafson et al.) and Lomma (Sk) 28 August 2006 (Jörgen Larsson, Vaileth Krantz), while one possible pair was seen at Gävle (Gstr) 17 April 2006 (Anders Johansson et al.). Hybrids were seen with two at Sövdesjön (Sk) 15 September 1988 (HKP), two at Västerfärnebo (Vstm) 28 February and 4 April 1998 (Markus Rehnberg), one at Yddingen (Sk) 25 July 2001 (HKP), two at Sövdesjön (Sk) 8 October 2003 (HKP) and one at Hornborgasjön (Vg) 21–29 May 2004 (Jörgen Fritzsön).

Anser albifrons x *Anser caerulescens*

Free-flying hybrids were produced at Kalmarsund (Sm) in the early 1930s (Berg 1937), while one was seen at Ilstorp (Sk) 18 October 1992 (Anders Jönsön).

Anser albifrons x *Anser erythropus*

One pair staged at Luspertjärn (Lu lpm) 20 May 1991 (Åke Aronsson). Maybe the same White-fronted Goose staged at Porjus (Lu lpm) 21 May 1989. In Skåne, one hybrid was seen at Ringsjön 15 November 1992 (HKP), one 2nd cy bird at Vomb 29 March–8 April 2004 (Nils Kjellén et al.) and very likely, the same individual at Tomelilla 15 December 2005 (HKP), Vombsjön 16 October 2006 (HKP) and Tomelilla 13 November 2006 (HKP), while a third individual was seen at Näsbyholmssjön 15 October 2006 (HKP). Outside Skåne, one hybrid was seen at Östen (Vg) 18 March 2001 (Andreas Gustafsson et al.) and one 2nd cy bird at Alviksgården (Nb) 29 April–3 May 2004 (Ulf Eriksson, Marie Björklund). These hybrids have no relation to the released Lesser White-fronted Geese but originate probably from hybridisation in the wild (Lerner 2005a). Two possible hybrids were seen at Roslagsbro (Upl) 7 October 2006 (Joakim Ekman, Gabriel Ekman).

Anser albifrons x *Anser fabalis*

One pair, the male a Siberian White-fronted Goose, produced three free-flying hybrids at Uppsala (Upl) in 1918 (*Svenska Jägareförbundets Tidskrift* 56(1918): 192, 318). One pair was seen at Tärnsjö (Upl) 28 March 2004 (Ulrik Lötberg, Lars Gustavsson), while one probable pair migrated at Vänersborgsviken (Vg)

11 September 2003 (Göran Darefelt) and one probable hybrid was seen at Kilsviken (Vrm) 3–4 June 1995 (Thomas Landgren, Torbjörn Mossberg).

Anser albifrons x *Anser indicus*

Free-flying hybrids were produced at Kalmarsund (Sm) in the early 1930s (Berg 1937).

Anser albifrons x *Branta canadensis*

Pairs were seen at Listersjön (BI) 1970, 1972 and 1973 (Nilsson & Lundgren 1993) and Brunnesjön (Ång) 13 May 2006 (Leif Johansson). Available sightings of hybrids, done north to Jämtland (Table A1), indicate that breeding took place more than once during the period 1985–2006. A Norwegian origin for at least some of the observed hybrids seems likely. Greater White-fronts have regularly been seen together with Canadas in Trøndelag for a number of years, and one hybrid, in appearance very alike the bird found in Jämtland in 2005, was seen in Tydal during spring migration in 2002, 2003 and 2004 (Sørhuus 2005).

Anser albifrons x *Branta leucopsis*

Successful breeding has been recorded on several occasions in Malmö (Sk) and at Skansen (Srm) (Curry-Lindahl 1959). One pair was seen at Getterön (HI) 12–19 April 2002 (Johan Frölinghaus), and singly hybrids at Foteviken (Sk) 13 December 1983 (HKP), Ilstorp (Sk) 21 November 1987 (Nils Kjellén), Vombs ängar (Sk) 30 October 1993 (Lars Nilsson), Tostberga (Sk) 3 March 2002 (Patric Österblad) and Hjälstaviken (Upl) 14–24 May 2005 (Martin Tjernberg et al.). Some of these hybrids might have originated from the Malozemelskaya and Bolshezemelskaya tundras, Yugorskij peninsula of Nenets Autonomous District of Arkhangelskaya region, where both mixed broods and hybrids have been recorded (Oleg Mineev pers. comm. to HKP).

Anser anser x *Anas platyrhynchos*

One pair, the male a Greylag, was seen in Halmstad (HI) 2 February 2006, 29 January 2007, 7 February 2007 and 28 February 2007 (Christer K. Andersson).

Anser anser x *Anser brachyrhynchus*

One pair was seen at Getterön (HI) 12 February 2007 (Roland Asteling), one possible pair at Rönnen (Sk) 1 April 2001 (Mats Rellmar) and one hybrid at Lena (Upl) 9 April 1994 (Håkan Andersson, Mathias Andersson).

Anser anser x *Anser caerulescens*

One pair was seen at Rinkaby ängar (Sk) 25 April 1997 (Greger Flyckt), three 2nd cy hybrids at Foteviken (Sk) 6 February 1979 (HKP), and singly hybrids at Ellestadsjön (Sk) 27 August–11 September 1985

(HKP), Barsebäck (Sk) 14 December 1985 (Stefan Cherrug) and Sörfjärden (Srm) 26–30 March 2005 (Lars Broberg). A male Snow Goose was intensively courting a Greylag Goose at Asköviken (Vstm) 3–4 April 2007 (Janne Virking, Markus Rehnberg).

Anser anser x *Anser canagica*

One 1st cy hybrid was seen at Lilla Hammars näs (Sk) 24 October 2004 (Nils Kjellén).

Anser anser x *Anser cygnoides*

One pair produced four fledglings at Fjällfotasjön (Sk) in 1985, (HKP). Singly hybrids were seen at Barsebäck (Sk) 8 December 1986–2 January 1987 (HKP et al.), Ellestadsjön (Sk) 24 June–30 July 1987 (HKP), Vombsjön (Sk) 24 December 1993 (Lars G R Nilsson), Ellestadsjön (Sk) 14 September 1996 (HKP), Foteviken (Sk) 18 October 1996 (HKP) and Hornborgasjön (Vg) 22 May 2005 (Jörgen Fritzsön), while two probable hybrids were seen at Hult (Vrm) 21–28 April 2004 (Anders Olsson, Magnus Köpman).

(*Anser anser* x *Anser cygnoides*) x *Anser anser*

Two 1st cy hybrids were seen together with their parents at Ellestadsjön (Sk) 24 June–20 July 1987 (HKP).

((*Anser anser* x *Anser cygnoides*) x *Anser anser*) x *Anser anser*

One bird was seen at Ellestadsjön (Sk) 3 August 1992 (HKP).

Anser anser x *Anser fabalis*

One pair, the male a Taiga Bean Goose, bred unsuccessfully at Yddingen (Sk) in 1992 (HKP), while a pair of captive origin, the male a Greylag Goose, made a breeding attempt at Årsta (Srm) in 2003 (Mats Gothner). A third pair, the male a Greylag Goose, wintering at the Kampanische Heide in the Netherlands since the early 1980s, was seen at Hagby (Ög) 25 October 1994 and Stepnica in Poland 4 November 1995 (van den Bergh 2004). Sightings of a pair in Stockholm (Srm/Upl) between 28 March 2002 and 10 May 2006 (Gunilla Hjorth et al.), and at Norrtälje (Upl) 7 December 2002–13 February 2003 (Bo Granberg, Karl-Olov Johansson) very likely refer to the aforementioned pair of captive origin. Pairs were seen also at Strängnäs (Srm) 2 May 2004 (Yngve Meijer), Vendelsjö (Upl) 20 August 2005 (Anders Arnell), Tranvik (Upl) 17 April 2006 (Carl Bredberg), Charlottenlund (Sk) 13 October 2006 (HKP), Näsbyholmsjön (Sk) 27 December 2006 (Anders Sennmalm) and Råda (Vg) 12 March 2007 (Johannes Löfqvist). In Skåne, one hybrid was seen at Vombsjön 6 September 2001, two at Vombsjön 12 October 2006 and one, together with its parents, at Charlottenlund 13 October 2006 (HKP).

Anser anser x *Anser indicus*

One pair was seen at Hornborgasjön (Vg) 16 May 2007 (Stig Karlsson et al.), while 20 sightings were reported during the period 1984–2006, but more than one individual was seen only twice (Table A2). A Norwegian origin for some of the observed individuals is possible, as breeding was recorded at Namsos in Nord-Trøndelag in July 1991 (Gustad 1992).

(*Anser anser* x *Anser indicus*) x *Branta canadensis*

One pair, where the hybrid was not fully identified, staged at Eggby (Vg) 14 May 2006 (Patrick Åström, Sofia Åström).

Anser anser x *Branta canadensis*

Free-flying hybrids were produced at Kalmarsund (Sm) as early as in the late 1920s (Berg 1930, 1937). Reports of hybrids among staging and wintering Canada geese started to appear in the 1960s (Borg 1962, Bolund 1964, Nord 1964, Jonasson 1966, Axelsson 1967, Johansson 1968), but observations were made in Norrköping already in the winter 1956–57. By now, this hybrid type has been reported from most parts of the country, but in some regions not until recently, as for instance, Gotland (1997) and Norrbotten (2003). In 2007, a mixed pair was seen in both Lule and Pite lappmark (Stefan Holmberg).

The earliest reported breeding occurred in Boulongerskogen (Hls) in the 1960s (Johan Södercrantz). Since then, breeding has been reported from large parts of the country. At the typical breeding site, there were no pairs of one of the species, while the other was represented by quite a number of pairs (see e.g. Elmfors 1980, Eriksson 1982, Cronert & Svensson 1991).

Some pairs were very productive, illustrated by observations of pairs with 11 juveniles at Vesán (Bl) 17 October 1989, 10 juveniles at Trolle-Ljungby (Sk) 8 September 1985, 9 juveniles at N Håslövs By (Sk) 19 November 1999 (HKP) and 8 juveniles at Jultorp Larv (Vg) 25 July 2007 (Ingemar Nilsson & Maj-Britt Nilsson). The largest observed family was a pair with 17 young at Krageholmssjön (Sk) 27 August 1992 (HKP), but in that case it must have been young born in both 1992 and 1991, maybe also in 1990. A flock of 15 hybrids was seen at Östen (Vg) 18 November 2006 (Patrick Åström) and another of 11 at Hökafältet (Hl) 10 February 2007 (Mikael Haraldsson).

(*Anser anser* x *Branta canadensis*) x *Anser anser*

Pairs were seen in Uppland before 1984 (Amcoff et al. 1984), at Lidingö (Upl) in the autumn of 1992 (Stefan Risberg et al.) and at Hästefjorden (Dsl) 16 November 2005 (Lars Eric Rahm). The hybrid at Lidingö had in the spring of 1992 been paired to a Canada goose (*Snatter* 18(1993): 4). Probable second-generation

hybrids were seen at Hjälstaviken (Upl) 23 May 2004 (Micke Nederman, Svenne Schultzberg), Kolboda (Sm) 16 September 2006 (HKP) and Stavholmsskäret (Vstm) 22 April 2007 (Thomas Pettersson).

(Anser anser x Branta canadensis) x Branta canadensis

Pairs with one young were seen at Södersjön (Upl) 10 July 1985 (Edholm 1987) and Järvafältet (Upl) 27 May–3 June 2001 (Michel Goiny, Svante Söderström), and a pair with two young at Hornborgasjön (Vg) 30 May 2006 (Patrick Åström). Breeding attempts were recorded at Limmaren (Upl) in 1982 (Bo Granberg), Nydala (Sm) in 1987 (Stefan Isaksson), Kristinehamn (Vrm) in 1991 (Thomas Landgren), Järvafältet (Upl) in 1998 (Järvafältets Ornitologiska Klubb) and Rinkebysjön (Sm) in 1999–2002 (Joakim Hagström). The hybrid at Järvafältet was a male, one year old in 1998. Breeding probably took place on several occasions during the period 1984–2006, bearing the large number of pairs reported during that period in mind (Table A3).

(Anser anser x Branta canadensis) x (Anser anser x Branta canadensis)

Eleven 1st cy birds were seen together with hybrid parents at Ellestadsjön (Sk) 29 July–1 August 1993 (Persson 1995a). A similar group, numbering 11 hybrids, was seen in the very same lake 12–14 September 1991, but at that time it was not possible to check if they made up a family (HKP).

Anser anser x Branta leucopsis

One pair bred successfully in Malmö (Sk) in 2005 (Tommy Holmgren), pairs were seen at Västra Ringsjön (Sk) 2 May 2002 (Lars Lundquist), Hyby (Sk) 2 April 2005 (Christer Sjögren), Isbladskärret (Upl) 30 April 2005 (Magnus Hägg), Marstrandsön (Boh) 5 May 2005 (Peter Strandmark) and Gillsby mossar (Öl) 15 April 2007 (Staffan Rodebrand), while one possible pair was seen at Vänersborgsviken 18 April 2007 (Göran Darefelt & Ingemar Johansson). Of 32 sightings of hybrids during the period 1984–May 2007, all but nine were made in Skåne (Table A4).

Anser anser x Cygnus olor

One pair, the male a Greylag Goose, produced at Stafanstorps (Sk) one fledgling in both 1972 and 1975 (Anders Björkman). The Greylag had been raised up by a Mute Swan pair.

Anser anser x Grus grus

One pair was seen at Sandsjön (Sm) 27–29 August 2007 (Sven Boberg).

Anser brachyrhynchus x Anser fabalis

Pairs were seen at Tåkern (Ög) in the autumn of 1985 (Ingemar Johansson), Hederviken (Upl) 12 April 2001 (Tommy Eriksson), Närtunaby (Upl) 16 April 2001 (Bo Granberg), Roxen (Ög) 29–30 March 2004 (Berndth Gustafsson, Magnus Lindberg) and Östen (Vg) 12–14 March 2007 (Lena Kempe), while probable pairs were seen at Kristinehamn (Vrm) 17 May 2003 (Per Gustafsson, Nisse Carlsson), Fjugesta (Nrk) 10 April 2006 (Fredrik Litsgård), Långhalsen (Srm) 22 April 2006 (Andreas Grabs) and Svensksundsviken (Ög) 17 October 2006 (Robert Petersen). Four juveniles were seen together with their parents, the male a Pink-footed Goose, at Tåkern (Ög) in the autumn of 1985 (Ingemar Johansson), while one hybrid was seen at Biskops-Kulla (Upl) 12 April 1984 (Tjernberg 1987), one at Mossheddinge (Sk) 19 October 1984 (HKP), one at Hjälstaviken (Upl) 18 September–2 November 1986 (Martin Tjernberg, Pekka Westin), one in (Vg) in 1997 (Lerner & Kampe-Persson 2006), two at Ilstorp (Sk) 24 November 2005 (HKP) and another two at Trolle-Ljungby (Sk) 7 December 2005 (HKP).

Anser brachyrhynchus x Anser serrirostris

One migrating possible pair was seen at Svältholmen (Gtl) 27 September 2006 (Olof Armini), while singly hybrids were seen at Tomelilla (Sk) 13 November 2006 (HKP) and Vanneberga (Sk) 8 December 2006 (HKP), the latter paired to a Pink-footed Goose (see below).

(Anser brachyrhynchus x Anser serrirostris) x Anser brachyrhynchus

One pair was seen at Vanneberga (Sk) 8 December 2006 (HKP), and maybe the same pair at Umeälvens delta och slätter (Vb) 31 March 2007 (Niklas Lindberg).

Anser brachyrhynchus x Branta leucopsis

One pair was seen at Rödön (Jmt) 28 May 2007 (Yngve Larsson).

Anser caerulescens x Anser fabalis

One hybrid was seen at Tåkern (Ög) 25 September–10 October 1988 (Anders Elf).

Anser caerulescens x Anser indicus

Three different individuals were probably involved in the sightings made during the years 1999–2006 (Table A5).

Anser caerulescens x Anser rossii

One adult was seen at Risinge (Öl) 4 September 2003 (Björn Liedén).

Anser caerulescens x *Branta canadensis*

Pairs bred at Ingsbergasjön (Sm) in 1978 (Thorin 1981), Viaredssjön (Vg) in 1983–84 (Magnus Neuendorf) and Kvarnsjön (Vg) in 1989, while a breeding pair was seen at Romanäs (Sm) in 2004 (Anders Ring). In Viaredssjön, Borås a pair occurred in 1982, made the first breeding attempt with three hatched eggs in 1983, while two hybrids were seen and six eggs resulted in at least four fledglings in 1984. During the following years (1985–86 and 1988) hybrids were observed in the same lake (for all observations at Viaredssjön, Magnus Neuendorf). The pair at Kvarnsjön was seen with five young 27 April (Hans-Erik Olausson). Hybrids from Ingsbergasjön were seen in the area around Anebygård, usually from the middle of August to the middle of October, the first four autumns three birds, then two birds up to 1986, and finally, one bird up to 1991. These hybrids were also seen elsewhere in Småland, for instance at Nävellsjö (Westring 1984). These hybrids might have had their winter quarters in western Skåne, where two birds wintered in 1981–1986 (Table A6). Other sightings made up to 1994 might have been of hybrids from either Ingsbergasjön, Viaredssjön or Kvarnsjön (Table A6).

Anser caerulescens x *Branta leucopsis*

One pair staged at Vombsjön (Sk) 1 April 1979 and two hybrids were seen at Barsebäck (Sk) 24 February–17 March 1987 (HKP). One pair produced hybrids at Hargs bruk (Upl) in 1994 (Fredriksson & Tjernberg 1996), and most likely also in 1995. Hybrids from Hargs bruk were maybe involved in all sightings made in Sweden during the period 1995–May 2007 (Table A7).

Anser canagica x *Branta leucopsis*

A total of 15 sightings exists, but few were identified with certainty (Table A8).

Anser cygnoides x *Branta canadensis*

One pair was seen at Säve (Boh) 23 March 2006 (Uno Unger) and Ytterby (Boh) 30 December 2006 (Lars Gustafsson), and singly hybrids at Tosteberga (Sk) 18–26 October 1986 (HKP), Barsebäckshamn (Sk) 17 January 1993 (Anders Jönsson), Fäholmen (Bl) 5 September 1995 (Patrik Österblad) and Eskilstorps ängar (Sk) 14 August 1999 (HKP).

Anser erythropus x *Branta canadensis*

One pair was seen at Falun (Dlr) 4 June 1989 (Fredrik Friberg et al.), one hybrid at Lilla Hammars näs (Sk) 22 February 1990 (Nils Kjellén) and probable singly hybrids at Lomma (Sk) 21 December 1999 (Anders Jönsson), Tranås (Sm) 4–8 April 2004 (Anders Ring) and Leksand (Dlr) 5 August 2006 (Bogdan Persson).

Anser erythropus x *Branta hutchinsii*

At least two different individuals (for descriptions, see Nilsson 1983, Österblad 1987) were recorded in West Blekinge and North-east Skåne on a number of occasions during 1979–1993 (Nilsson 2000, Table A9). In all probability, these hybrids originated from the breeding of geese at Eriksberg (Bl) (Nilsson 1983). In 1983, one of these hybrids made a breeding attempt paired to a Barnacle Goose (see below).

(Anser erythropus x *Branta hutchinsii*) x *Branta leucopsis*

One pair, the male a hybrid, made a breeding attempt at Karlshamn (Bl) in 1983, but none of the four eggs hatched (Nilsson 1984).

Anser erythropus x *Branta leucopsis*

Breeding has since 2002 become annual in Jämtland and Hälsingland. A male Lesser White-fronted Goose, cross-fostered by Barnacle Geese, and paired to a Barnacle, bred in at least three successive years (Fabricius 1991). One hybrid was born in Stockholm (Upl) in 1985 (Kyrk 1987), and seen at Isbladskärret (Upl) 26 August–4 September 1985 (Thomas Strid). The four hybrids in Skåne in autumn 1994 (Table A10) indicate that another successful breeding took place that year. Up to 2002, possible pairs were reported from Flöjelberget (Ång) 22 August 1998 (rrk Ång), Ledskärsområdet (Upl) 6 August 1999 (Johan Södercrantz, Kjell Pålsson), Rödön (Jmt) 31 May 2001 (Sölve Westlund), Söderbärke (Dlr) 26 August–12 September 2001 (Yngve Johansson et al.) and Kronholmens fyr (Gtl) 4 May 2002 (Olof Armini). In 2002, one hybrid was produced in the Archipelago of Söderhamn (Hls) (Bo Fagerström), while one hybrid was seen with its parents at Araviken (Jmt) 23 August (Sölve Westlund). In 2003, one possible pair was seen at Tunasjön (Hls) 4 June 2003 (Bo Johnsson). In 2004, at least four male Lesser White-fronted Geese paired to Barnacle Geese bred in Sweden (Bo Fagerström). In the Archipelago of Söderhamn (Hls) at least two pairs bred, producing 1+3 hybrids. In Jämtland, two pairs produced a total of 4–5 hybrids (Bo Fagerström). In 2005, breeding at Ålsjön (Hls) resulted in two fledglings (Stefan Persson et al.). In 2006, one gosling was seen together with its parents at Stålnåshararna (Hls) 5 July (Esbjörn Nordlund), while another three 1st cy birds were seen at Hjälstaviken (Upl) 26 August (Martin Tjernberg). In 2007, five 1st cy birds were seen together with their parents at Gävletravet (Gstr) 1–4 August (Yngve Meijer et al.), and probably the same family at Hjälstaviken (Upl) 26 August (Martin Tjernberg).

Two sites frequently used by staging hybrids during the years 2004–2006, at least by those born in Hälsingland, were Gävletravet (Gstr) in August and Hjälstaviken (Upl) from mid-August to mid-October.

Some birds staged at Hjälstaviken also in May and early June. Hybrids were occasionally seen also at other sites in Jämtland, Hälsingland, Gästrikland and Uppland. Sightings further south were mainly done in Gotland and Skåne (Table A10).

Winter quarters of these hybrids were situated in the Netherlands (Bo Fagerström, Koffijberg et al. 2005) and the Doñana area, South-west Spain (Kampe-Persson 2004).

(Anser erythropus x Branta leucopsis) x Branta canadensis

One pair, the male a hybrid, bred unsuccessfully at Gussjön (Ång) in 1989 (Sjöberg 1990); none of the six eggs hatched. The pair was seen at the breeding site 11 May–20 July, and at Härnösand 20 September (Leif Johansson).

Anser fabalis x Anser serrirostris

Possible pairs were seen at Vadsjön (Srm) 21 February 2004 (Göran Andersson), Tofta kile (Boh) 7 April 2004 (Peter Strandvik), Foteviken (Sk) 12 January 2005 (Claes Larsson et al.), Östansjösjön (Ång) 16 April 2005 (Bo Nensén), Svartsjövik (Upl) 1 April 2006 (Linus Brobacke, Signe Hagerman), Mellsta by (Öl) 14 October 2006 (Peter Bryngelstam, Per Nyberg), Gräsgårds hamn (Öl) 22 October 2006 (Olle Wahlentin) and Hullsjön (Vg) 12 March 2007 (Kent Kristenson & Saga Boberg). Three adult hybrids were seen at Vombs ängar (Sk) 3–8 October 2004, one adult at Trolle-Ljungby (Sk) 2 November 2005, and at Karsholm (Sk) 8 December 2006 as well, and one individual at Vellinge ängar (Sk) 10 September 2006 (HKP). Birds reported as morphologically intermediary to Taiga and Tundra Bean Goose might have been hybrids; four at Skatelövsfjorden (Sm) 19 February 2001 (Joakim Hagström), 2–3 at Tydjesjön (Dls) 8 March 2002 (Håkan Krave) and two at Umeälvens delta och slätter (Vb) 28 October 2002 (Emmanuel Naudot).

Anser fabalis x Branta canadensis

One pair was seen at Hålsjö (Hls) 29 April–9 May 2001 (Arnold Larsson, Mats Åberg), Delsbo (Hls) 14 April 2002 (Arnold Larsson) and Bjuråker (Hls) 28 April 2002 (Arnold Larsson), and maybe the same at Torslanda (Boh) 20 February 2004 (Johan Svedholm). At least two hybrids were seen at Kristianstad (Sk) in the winter 1983/84 (Benny Lorentzon in litt. to HKP), another two at Rönningsberg (Jmt) 30 September 1994 (Berth Bergman) and one adult probable hybrid at Krageholmsjön (Sk) 29 December 2001 (Roger Jonsson). These hybrids were thought to be an unexpected outcome of a re-establishment project run by the Swedish Association for Hunting and Wildlife Management (cf. Holmberg 1986). During the years

1974–1991, a total of 376 Taiga Bean goslings, with Greater Canadas as foster parents, were released in the provinces Dalarna, Härjedalen and Hälsingland (von Essen 1982, Svensson et al. 1999). Several of these families wintered at Höllviken, South-west Skåne (HKP). One male from this project, paired to a Greater Canada Goose, bred at Öster-Malma (Srm) for five years, before he was removed, whereupon the female re-paired with a Greylag Goose and finally with a Canada Goose (Fabricius 1991).

(Anser fabalis x Branta canadensis) x Branta canadensis

One pair, the male a hybrid, was seen at Hög kyrka (Hls) 16 March 2007 (Kenneth Karelus).

Anser indicus x Branta canadensis

This hybrid type was mainly reported from Skåne, usually singly, but there were also observations of a family at Täkern (Ög) in 1987 and 1988 (Table A11).

Anser indicus x Branta leucopsis

One pair made up of two hybrids was recorded in South-west Skåne during the years 1985–1994 (see below). After that one of the mates had died, the surviving bird continued to use the same sites, and bred paired to a Greylag Goose in 1997 (see below). This individual was last seen 15 September 2001, when more than 17 years old (HKP). Sightings of other individuals than the two afore-mentioned ones were also they mainly done in South-west Skåne (Table A12).

(Anser indicus x Branta leucopsis) x Anser anser

In Skåne in 1997, one young was seen together with its parents at Fjällfotasjön 29 May–24 June, while the pair, without young, was seen at Börringesjön and Foteviken 11 July–21 October (HKP).

(Anser indicus x Branta leucopsis) x (Anser indicus x Branta leucopsis)

In Skåne, one pair, first recorded at Yddingen 7 May 1985, bred unsuccessfully at Fjällfotasjön annually during the period 1986–1994 (HKP). After leaving the breeding site, the pair spent the rest of the summer and autumn at Börringe and Foteviken (HKP).

Branta bernicla x Branta hrota

One bird was seen at Torhamns udde (Bl) 26 September 2002 (Fredrik Lennartsson).

Branta bernicla x Branta leucopsis

Ten sightings, all of them from the last three-year period, involved probably at least three different individuals (Table A13).

Branta canadensis x *Branta leucopsis*

Since the first sighting in 1969 (Table A14), the increase in both total number of observations and the number of winter sightings (Table A15) parallel the development of the Swedish Barnacle Goose population (Ganter et al. 1999).

One pair, the male a Barnacle Goose, produced three hybrids at Västra Harg (Ög) in 1985 (Gunnar Björkman). Another pair, the Barnacle Goose born at Skansen (Srm), bred at Skanssjön (Vstm) in the years 1992–1994, producing 4 young in 1992 (Pontus Lindberg, Markus Rehnberg) and five in 1994 (Per Eriksson, Stefan Johansson). In 1992, a third pair was seen in Lagårdssjön (Vstm), with five juveniles in September (Nils Erik Zetterström). At Skanssjön, breeding was recorded also in 2000, while two pairs were reported in 2001 (Per Eriksson). A pair with five newly-fledged young was seen at Tjolöholm (HI) 26 July 2002 (Göran Säwén). Pairs were seen at Vimmerby (Sm) 21 April 2007 (Sam Hallingfors) and Styrnäs (Ång) 6 May 2007 (Lasse Bengtsson). Breeding has most likely also occurred in Dalarna, at least during the last few years.

In Västmanland, this hybrid type was recorded from February to November annually from 1992, with as many as ten birds at Färdsjär 29 September 2004 (Ralf Lundmark) and eight at Västerås 26 October 2003 (Markus Rehnberg). In Dalarna, this form was recorded from March to November, one bird 11 May 1997 (Lars Hansson et al.), annually from 2002, with as many as eight birds at Gustafs 4 October 2003 (Nils-Erik Björkbacka, Erik Björkbacka) and five at Tyllsnäs 7 November 2004 (Nils-Erik Björkbacka). In March and April, this hybrid type was frequently seen in Småland, with as many as seven birds at Vidöstern 13 March 2001 (Roger Ahlman et al.), but also in Halland (2006), Gotland (2001), Västergötland (2001, 2002, 2003, 2004, 2007), Östergötland (2005, 2007), Bohuslän (2002), Dalsland (2002, 2007), Närke (2005, 2006), Sörmland (2001, 2004, 2005, 2006), Uppland (2002, 2003, 2006, 2007) and Gästrikland (2007). Summer and early autumn sightings were done in the same regions, and in Öland and Skåne as well. The largest autumn flock was 15 birds at Landsjön (Sm) 7–11 October 2006 (Stefan Löfgren, Toni Hermansson). Late autumn sightings include two at Hederviken (Upl) 6 November 2005 (Ulf Linnell, Åke Österberg), one at Brissund (Gtl) three days later (Lars Ericson), one at Östen (Vg) 18 November 2006 (Patrick Åström), one at Dettern (Vg) 26 November 2006 (Göran Darefelt) and one at Tösse (Dsl) 28 November 2006 (Tage Kyrk).

(Branta canadensis x *Branta leucopsis*) x *Branta canadensis*

Four juveniles were seen together with their parents, the male a Greater Canada Goose, at Eriksberg (Vstm) 10 October 1997 (Per Eriksson), while pairs were seen at Vrångö (Vg) 25 April 1997 (Gösta Olofsson), Steneby (Dsl) 2 April 2002 (Inge Haraldsson), Västerås (Vstm) 20 April 2002 (Markus Rehnberg) and Lisjö ängar (Vstm) 18 May 2006 (Ralf Lundmark).

(Branta canadensis x *Branta leucopsis*) x *Branta leucopsis*

Breeding was recorded at Skanssjön (Vstm) in 2000 (Per Eriksson). Pairs were seen at Friberg (Upl) 10 June 2002 (Pekka Westin), Hjälstaviken 31 March–3 April 2003 (Gabriel Ekman et al.) and Västsura (Vstm) 9 April 2006 (Maj Karsten). Five second-generation hybrids were seen together with one first-generation hybrid at Skrea (HI) 19 January 2005 (Joakim Hagström), while one second-generation hybrid staged together with one first-generation hybrid at Kolbäck (Vstm) 31 March 2005 (Per Eriksson).

Branta canadensis x *Cygnus cygnus*

One Greater Canada Goose was seen courting a Whooper Swan *Cygnus cygnus* at Idbyfjärden (Ång) 27 April 2007 (Sven Edfors, Anders Lindström). Two days later, the swan was seen alone at that site (Bo Nensén).

Branta hutchinsii x *Branta leucopsis*

The most probable origin of the hybrids observed ever since 1998 (Table A16) is Malmö (Sk), where one pair produced two young in 2004 (Jim Sundberg, Jonas Sundberg).

(Branta hutchinsii x *Branta leucopsis*) x *Branta leucopsis*

One 1st cy bird was seen together with its parents at Foteviken (Sk) 13 September–12 October 2005, and probably the same second-generation hybrid around Foteviken (Sk) 20 October 2006–22 January 2007 (HKP). Two birds seen at Årike Fyris (Upl) 11 October 2005 might have been of this hybrid type (Johan Södercrantz et al.). One probable pair was seen at Roxen (Ög) 7–8 April 2007 (Filip Larsson & Anders Ring).

Branta leucopsis x *Branta ruficollis*

All sightings of this form, eleven in total, were made along the migration route of the Russian Barnacle Goose population (Ganter et al. 1999), and regarded singly birds (Table A17). The first sighting was of a bird that wintered at Haringvliet in the Netherlands (van der Lee & Ouweneel 1976, Högström 1980).

In the following Appendix tables (A1–A17), the four columns refer to, from left to right: date, number of individual hybrids (pairs in Table A3), site, and observer or reference. Date is given as day, month, year. When nothing else is stated, the observations refer to numbers observed through August 2007.

I följande Appendix-tabeller (A1–A17) avseer de fyra kolumnerna, från vänster till höger: datum, antal hybridindivider (par i Tabell A3), lokal och observatör eller referens. Datum ges i form av dag, månad och år. När inget annat anges gäller observationerna fåglar som setts till och med augusti 2007.

Table A1. Siberian White-fronted Goose x Greater Canada Goose. *Bläsgås x kanadagås.*

7.10.1985	1 ¹	Rådasjön (Upl)	Michael Averland
23.11.1985	1 ¹	Finsta (Upl)	Lars Olsson, Michael Averland
27.6.1989	1	Mölle (Sk)	Anders Jönsson
30.9.1989	2	Foteviken (Sk)	Ola Elleström, Hans Larsson
8.4.1990	1	Vattenmöllan (Sk)	Anders Jönsson, Kerstin Svalin
24.2.1991	1	Värpinge (Sk)	Nils Kjellén
11–18.7.1992	1	Höganäs (Sk)	Christer Lundin
15.11.1993	1	Vanneberga (Sk)	Niklas Holmkvist
10.2.1994	1	Vombsjön (Sk)	Anders Jönsson
29.3.1997	2	Fläcksjön (Vstm)	Ralf Lundmark
30.10–5.11.1997	1–3	Kolbäck (Vstm)	Ralf Lundmark
11.4.1998	2	Karbenning (Vstm)	Ralf Lundmark
14.10.2000	2	Sjötörpasjön (Vg)	Ulla Carlsson, Ingemar Carlsson
25.12.2000–24.2.2001	2	Alnarps/Lomma (Sk)	Lars Nilsson et al.
15.4.2001	2	Sonnboviken (Dlr)	Berndt Söderlund
2.9.2001	1	Knösen (Sk)	Tommy Holmgren
17.10.2001	1	Landskrona (Sk)	HKP
16.10.2003	2	Barsebäckshamn (Sk)	HKP
8.10.2004	1	Medstuguån (Dlr)	Sørhuus (2005)
1.4.2005	1	Mockfjärd (Dlr)	Vesa Juujärvi
8.5.2005	1	Njurunda (Mpd)	Staffan Bergman, Ingvar Wedberg
14.8.2005	1	Bodsjöbränna (Jmt)	Sørhuus (2005)
9.9.2005	1	Trönninge ängar (Hl)	Joakim Lindblom
30.10.2005	1	Roxen (Ög)	Anders Elf
2.11.2005	1	Göteborg (Vg)	Uno Unger
20.12.2005	1	Säve (Boh)	Johan Svedholm
2.4.2006	1	Ekoparken (Upl)	Andreas Zetterberg
9.10.2006	1	Järvafältet (Upl)	Charles Wiklund
11–12.3.2007	1	Järvafältet (Upl)	Stefan Kyrklund et al.

¹ = probably the same individual. *Troligen samma individ.*

Table A2. Greylag Goose x Bar-headed Goose. *Grågås x stripgås.*

16.9–19.10.1984	1	Böringe (Sk)	HKP
4.11.1985	1	Bromölla (Sk)	HKP
15.8–15.9.1988	1	Sövdesjön (Sk)	HKP
5.3.1989	1	Sövdesjön (Sk)	Anders Jönsson
6.10.1990	2	Foteviken (Sk)	Joakim Hagström
21.10.1995	1	Foteviken (Sk)	HKP
1.11.1998	1	Barsebäckshamn (Sk)	Kent Andersson
25.2–10.3.1999	1	Veselången (Vg)	Mikael & Joakim Karlsson
6.3 and 11.4.1999	1	Östen (Vg)	Kent-Ove Hvass
2000	1	(Ög)	Lerner & Kampe-Persson (2006)
31.7–2.8.2001	1	Bara (Sk)	HKP
3.9.2002	5	Frövi (Vstm)	Jan-Erik Malmstigen
23.7–7.9.2003	1 ¹	N Hyn (Vrm)	Magnus Köpman et al.
5.6–31.10.2004	1 ¹	Klarälvsdeltat/N Hyn (Vrm)	Per Gustafsson et al.

27.3.2005	1	Roxen (Ög)	Lasse Linde
April–October 2005	1	Svartåmynningen (Ög)	Carlsson et al. (2006)
8.5–8.9.2005	1 ¹	N Hyn (Vrm)	Dan Mangsbo et al.
2.4.2006	1	Bergs mader (Boh)	Per Karlsson
1–2.5 and 25.7.06	1 ¹	N Hyn/Södra Hyn (Vrm)	Dan Mangsbo et al.
1.10.2006	1 ¹	N Hyn (Vrm)	Dan Mangsbo

¹ = probably the same individual. *Troligen samma individ.*

Table A3. Greylag Goose x Greater Canada Goose hybrid and Greater Canada Goose, non-breeding pairs. *Grågås x kanadagås-hybrid och kanadagås, icke häckande par.*

7–17.4.1984	1	Väsby sjön (Upl)	Bill Douhan
23.4–20.5.1984	1	Hosjön (Upl)	Bill Douhan, Gabriel Ekman
7.4.1985	2	Kundbysjön (Upl)	Bill Douhan, Bo Granberg
12.5.1985	1	Lövstabruk (Upl)	Mats Edholm
29.3.1987	1	Kundbysjön (Upl)	Bo Granberg, Bill Douhan
Spring 1992	1 ¹	Lidingö (Upl)	Stefan Risberg et al.
29.10.1994	1	Skärholmen (Srm)	Mats Gothnier
30.11.1994	1	Albysjön (Srm)	Bengt Jansson
3.4.2001	1	Forsa (Hls)	Mats Axbrink
9.4.2002	1	Ekebysjön (Upl)	Henrik Bergendal
10–31.7.2002	1	Edsbergs slott (Upl)	Michel Goiny
25.3.2003	1	Sjötorpasjön (Vg)	Albin Thorsson, Ulla Carlsson
3.4.2004	1	Tidaholm (Vg)	Magnus Hallgren
22.4–14.5.2004	1	Tidaholm (Vg)	Magnus Hallgren
26.4.2004	1	Bälteberga (Vg)	Magnus Hallgren
29.4.2004	1	Klarälvsdeltat (Vrm)	Per Gustafsson
17.9.2004	1	Kvicksund (Srm/Vstm)	Markus Rehnberg
23.3.2005	1	Ramnäs (Vstm)	Ralf Lundmark
2.4.2005	1	Skövde (Vg)	Christopher Magnusson
8.4.2005	1	Lövön (Upl)	Svenne Schultzberg
21.4–6.5.2005	1	Eskilstorps ångar (Sk)	Nils Kjellén
3–10.5.2005	1	Ekoparken (Upl)	Erik Peurell
2–3.4.2005	1	Asköviken (Vstm)	Markus Rehnberg
15.6.2005	1 ²	Asköviken (Vstm)	Markus Rehnberg
22.3.2006	1	Stenungssund (Boh)	Owe Hougström
24.3.2006	1 ³	Västerstadsviken (Öl)	Tommy Knutsson
30.3–1.4.2006	1	Gnien (Vstm)	Ralf Lundmark
11.4.2006	1	Baggensstaket (Upl)	Nils Magnus Fredriksson
6–9.5.2006	1	Järvafältet (Upl)	Blanca Larkeson, Martina Kadin
9.5.2006	1	Hornsjön (Vg)	Lars-Göran Lindgren
18.5.2006	1	Ullersättersviken (Vstm)	Jan-Erik Malmstigen
8.6.2006	1	Hässelby (Upl)	Niklas Westermarck et al.
23.7.2006	1	Ekoparken (Upl)	Nils Magnus Fredriksson
12.5.2007	1 ²	Järvafältet (Upl)	Björn Wester

¹ = paired to a Greylag Goose in autumn 1992. *I par med grågås under hösten 1992.*

² = the hybrid was a female. *Hybriden var en hona.* ³ = the hybrid was a male. *Hybriden var en hane.*

Table A4. Greylag Goose x Barnacle Goose. *Grågås x vitkindad gås.*

16–28.9.1984	1	Klosterviken (Sk)	HKP
19–20.10.1984	1	Saritslöv (Sk)	HKP
5.4.1985	1	Kapelludden (Öl)	Wallin (1995)
12.1–2.2.1990	1	Foteviken (Sk)	Jan Åke Hillarp
29.8–20.9.1992	1	Svensksundsviken (Ög)	Fredrik Johansson

5.9.1996	1	Björkesåkrasjön (Sk)	HKP
9.9.1996	1	Vombsjön (Sk)	HKP
11–14.9.1996	3	Ellestadsjön (Sk)	HKP
15.10–10.11.1996	1–2	Vombsjön (Sk)	HKP
2.12.1996	1	Glostorp (Sk)	HKP
24.9.1998	2 ¹	Malmö (Sk)	HKP
25.9.1998	2 ¹	Havgårdssjön (Sk)	HKP
20–31.10.1998	2	Foteviken (Sk)	HKP
11.11.1998	1	Malmö (Sk)	HKP
4–14.4.1999	1	Kilsviken (Vrm)	Thomas Landgren et al.
21.10.1999	1	Foteviken (Sk)	HKP
21.11.1999	1	Salviken (Sk)	Nils Kjellén
13.5.2000	1	Hornborgasjön (Vg)	Magnus Hallgren
14.4.2003	1	Hornborgasjön (Vg)	Andreas Zetterberg et al.
4.8.2004	1	Beijershamn (Öl)	Göran Dahlman
20.9.2004	1	Edsbergs slott (Upl)	Michel Goiny
2.6.2005	1	Tannamskilen (Boh)	Pär Lydmark
7–11.10.2005	1	Spillepeng (Sk)	HKP
12.10.2005	1	Lilla Hammars näs (Sk)	HKP
15.10.2005	1	Ellestadsjön (Sk)	HKP
30.8.2006	3	Lomma (Sk)	Max Lundberg
9.9.2006	1	Ellestadsjön (Sk)	HKP
17.10.2006–2.1.2007	4 ²	Lomma/Lundåkrabukten (Sk)	HKP
20.10.06–25.1.2007	1	Foteviken (Sk)	HKP, Peter Öhrström
16.11.2006	1	Spillepeng (Sk)	HKP
13.1.2007	2	Flyingeby (Sk)	HKP
22.4.2007	1	Petgårde träsk (Öl)	Uno Unger, Mats Wallin

¹ = different individuals. *Olika individer.* ² = together with parents. *Tillsammans med föräldrar.*

Table A5. Snow Goose x Bar-headed Goose. *Snögås x strippgås.*

1.1–13.3.1999	1	Rinkaby/Yngsjö (Sk)	Greger Flyckt
21.4.1999	1	Spillepeng (Sk)	Anders Jönsson
30.10–5.12.1999	1	Tosteberga (Sk)	Greger Flyckt
14.5.2000	1	Håslövs ängar (Sk)	Erik Schönbeck
28.10.2005	1 ¹	Torslandaviken (Vg)	Uno Unger
16.5.2006	1 ¹	Lövsund (Srm)	Arne Hellström
8.8–3.12.2006	1 ¹	Stockholm (Upl)	Glenn Cornland et al.
18.11.2006	1 ¹	Östen (Vg)	Patrick Åström

¹ = ad. *Adult.*

Table A6. Snow Goose x Greater Canada Goose, except Småland and Västergötland 1978–1991. *Snögås x kanadagås utom i Småland och Västergötland 1978–1991.*

9–10.2.1981	2	Habo Lung (Sk)	Paul-Eric Jönsson, Göran Karlsson
9.1–23.2.1982	2	Barsebäck (Sk)	Anders Jönsson, HKP
25.12.1982	2	Klagshamn (Sk)	Jesper Segergren
13–18.2.1983	2	Barsebäck (Sk)	Anders Jönsson et al.
7.1–25.2.84	2	Kullabygden (Sk)	Kullabygdens ornitologiska förening
17.4.1984	1	Borrie (Sk)	HKP
2.2.1985	2	Barsebäck (Sk)	Ulf Gårdenfors
12.12.85–16.3.86	2	Barsebäck (Sk)	Anders Jönsson et al.
24.2–17.3.1987	1	Foteviken (Sk)	HKP
15–25.9.1989	1	Foteviken (Sk)	Anders Jönsson et al.
5.1.1992	1	Skanör (Sk)	Joakim Hagström

20.9.1992	1	Visingsö (Sm)	Åke Ankarberg
6–17.11.1992	1	Lundåkrabukten (Sk)	Anders Jönsson
27.10.1993	1	Jönköping (Sm)	Jan-Erik Henriksson
10.3.1993	1	Knösen (Sk)	Anders Jönsson
26.11.1994	1	Barsebäck (Sk)	Ola Elleström, Johan Lorentzon
16.9.2001	1	Tjolöholm (Boh)	Andreas Wållberg
17.10.2006	1 ¹	Värpinge (Sk)	HKP
17.10–16.11.2006	1 ¹	Barsebäck (Sk)	HKP

¹ = different individuals. *Olika individer.*

Table A7. Snow Goose x Barnacle Goose 1995–August 2007. *Snögås x vitkindad gås 1995–augusti 2007.*

2.1–11.3.1995	2–5	Segesholm/Rinkaby (Sk)	Christer Neideman, Johan Svedholm
26.3–9.4.1995	3–5	Angarnsjöängen (Upl)	Erik Koppe et al. (Angarngruppen)
September 1995	6	Enköping (Upl)	Sven Pettersson
6–11.11.1995	7	Vanneberga (Sk)	Leif Klinteroth et al.
10.3–26.5.1996	4	Hammarsjön (Sk)	Mårten Björnsson et al.
3.9–21.10.1996	1+1	Stockholm (Srm/Upl)	Engström (1996), L Samuelsson et al.
7.10.1997	1	Vaxholm (Upl)	Lennart Werner
6–15.10.1998	2	Vellinge ängar (Sk)	HKP
23.8–3.9.2001	1	Ottenby (Öl)	Kent Andersson
16.9.2001	2	Salviken (Sk)	HKP
17.9.2001	1	Nabben (Sk)	Nils Kjellén
25.5–18.7.2002	1	Hornborgasjön (Vg)	Kent-Ove Hvass et al.
1–10.6.2002	1	Vannebergholmen (Sk)	Olof Jönsson, Kaj Svahn
10.8–1.12.2002	1	Lommabukten (Sk)	Lars Nilsson et al.
25.9.2003	1	Nabben (Sk)	Nils Kjellén
30.11.2003	2	Barsebäck (Sk)	Nils Kjellén
9–16.4.2004	1	Nyen (Gtl)	Sten Wikström et al.
20.10.2004	2	Höjeå (Sk)	HKP
13.11.2004	1	Morup (Hl)	Uno Unger
16.4.2005	1	Hammaren (Gtl)	Marie Jacobsson et al.
13.9–12.10.2005	1	Foteviken (Sk)	HKP
18.7.2006	1	Sandarviken (Gtl)	Carl Tholin, Michael Tholin
18.7.2006	1	Sallmandsudd (Gtl)	Carl Tholin, Michael Tholin
23.8.2006	1	Rivet (Gtl)	Carl Tholin
9.2.2007	1	Tolångaån (Sk)	HKP

Table A8. Emperor Goose x Barnacle Goose. *Kejsargås x vitkindad gås.*

25.4.1993	1	Närsholmen (Gtl)	Jesper Danielsson
23–29.4.1994	1	Närsholmen (Gtl)	Per Smitterberg et al.
13.5.1994	1	Lausvik (Gtl)	Per Smitterberg
8–9.10.1994	1	Faludden (Gtl)	Jörgen Petersson
15.10.1994	1	Hoburgen (Gtl)	Jörgen Petersson et al.
24.4–13.5.1995	1	Närsholmen (Gtl)	Per Smitterberg et al.
26.4–7.5.1996	1	Närsholmen (Gtl)	Per Smitterberg et al.
27.4–10.5.1997	1	Närsholmen (Gtl)	Olof Armini et al.
9.6.1997	1	Laus holmar (Gtl)	Henk van der Jeugd, Kjell Larsson
15.4.1998	1	Närsholmen (Gtl)	Anders Elf
25.4–7.5.1999	1	Austerviken (Gtl)	Jörgen Petersson
26.4–3.5.1999	1	Stockviken (Gtl)	Bimbi Ollberg, Tina Ollberg
9.4.2000	1	Djaupdy (Gtl)	Sylve Häglund
31.8–13.9.2005	1	Lilla Hammars näs (Sk)	Johan Södercrantz et al.
8.4.2007	1 ¹	Lillvik (Gtl)	Per Smitterberg

¹ = ad. *Adult.*

Table A9. Lesser White-fronted Goose x Lesser Canada Goose. *Fjällgås* x *dvärgkanadagås*.

5.8.1979	2	Tosteberga (Sk)	HKP
30.11–1.12.1980	1	Ådala, Mjällby (Bl)	VBOF ²
14–16.3.1981	1	Matvik, Karlshamn (Bl)	Karlshamns Fältbiologer
13.3.1982	1	Mjällby (Bl)	Mårten Hammar
12.5.1982	1	Eriksberg, Karlshamn (Bl)	Ingemar Jönsson et al.
23.7.1982	1	Tocken, Mjällby (Bl)	Mats-Åke Persson
29.10.1982	1	Trolle-Ljungby (Sk)	HKP
20.5–30.6.1983	1	Eneskäret, Karlshamn (Bl)	Hans Linderson et al.
20.11.1983	1	Sölvedal (Bl)	Mats-Åke Persson
4–7.12.1983	1	Ådala, Mjällby (Bl)	VBOF ²
30.9.1984	1 ¹	Trolle-Ljungby (Sk)	HKP
1–11.11.1984	1 ¹	Trolle-Ljungby (Sk)	HKP
22–23.11.1984	1	Lörby (Bl)	Thomas Nilsson
26.11.1984	1	Ådala, Mjällby (Bl)	Thomas Nilsson
8.8.1985	1	Fäholmen (Bl)	Mårten Hammar, M-Å Persson
16–26.10.1986	1	Tosteberga (Sk)	HKP et al.
10.11.1986	1	Sölvedal (Bl)	Patrik Österblad
1–3.12.1986	1	Ådala, Mjällby (Bl)	Patrik Österblad
5.12.1986	1	Ysane (Bl)	Mats-Åke Persson
27.3.1987	1	Ådala, Mjällby (Bl)	Patrik Österblad
15.8.1987	1	Vannebergaholmen (Sk)	Magnus Persson, Leif Klinteroth
15.4.1989	1	Matvik, Karlshamn (Bl)	Kjell Essebo
1.1.1993	1	Vesan (Bl)	Johan Wolgast
23.1–14.2.1993	1	Ådala, Mjällby (Bl)	Patrik Österblad et al.
4.9.1993	1	Fäholmen (Bl)	Mats-Åke Persson
12.9.1993	2	Fäholmen (Bl)	Mats-Åke Persson

¹ = different individuals. *Olika individer*. ² = Västblekings ornitologiska förening *Orn. Soc. W. Blekinge*

Table A10. Lesser White-fronted Goose x Barnacle Goose, except individuals seen together with their parents or involved in breeding attempts through May 2004, and all observations outside Jämtland, Hälsingland, Gästrikland and Uppland in June 2004–August 2007.

Fjällgås x *vitkindad gås*, utom individer som setts tillsammans med sina föräldrar eller involverade i häckningsförsök till och med maj 2004, samt alla observationer utanför Jämtland, Hälsingland, Gästrikland och Uppland under juni 2004–augusti 2007.

1–15.5.1987	1	Västergarn (Gtl)	Olof Armini et al.
25.3.1990	1 ¹	Stigsjö (Ång)	Leif Johansson
1–2.5.1991	1	Hoburgen (Gtl)	Björn Andersson et al.
19–20.9.1991	1 ¹	Stigsjö (Ång)	Leif Johansson, Oskar Norrgren
12.4.1993	1	Hudiksvall (Hls)	Bo Fagerström
31.8–1.10.1994	1	Djurgården (Upl)	Fredrik Taube
19.11–30.12.1994	4	Vanneberga/Rinkaby (Sk)	Leif Klinteroth
6–8.9.1999	1	Ottenby (Öl)	Ivar Kleman
25.10.2000	1	Järvafältet (Upl)	Johan Nilsson
27.9–25.10.2001	1	Järvafältet (Upl)	Johan Nilsson
6.9.2003	1	Helenelund (Upl)	Johan Nilsson
5.10.2003	1	Edsbergs slott (Upl)	Johan Nilsson, Björn Wester
28.2.2004	1	Flyingeby (Sk)	Olof Jönsson et al.
21.4.2004	1	Södviken (Öl)	Staffan Rodebrand
6.10.2004	1 ²	Björkesåkrasjön (Sk)	HKP
20.10.2004	1 ²	Höjeå (Sk)	HKP
29.3.2005	1	Hornborgasjön (Vg)	Matthis Persson
4.4.2005	6	Fröbbestad (Vstm)	Gunnar Nicklasson
5.10–10.11.2005	1	Norrköping (Ög)	Messer (2005), Johan Brenander et al.

21.11.2005	2	Stora Uppåkra (Sk)	HKP
9–27.4.2006	1	Svanviken (Srm)	Jan Hägg et al.
11.5.2006	1	Lausviken (Gtl)	Göran Knutas
11.5.2006	1	Kåseberga (Sk)	Sven Splittorff et al.
13.5.2006	1	Kåseberga (Sk)	Olof Jönsson et al.
6.8.2006	5	Lomma (Sk)	Anders Jönsson
7–9.9.2006	1	Svanviken (Srm)	Kalle Brinell, Jan Hägg
21.9.2006	1	Ringstad mosse (Ög)	Stig Löwenhamm
11–17.10.2006	1	Norrköping (Ög)	Robert Petersen et al.
17.10.2006	1	Barsebäck (Sk)	HKP
20.10.2006	1	Vellinge ängar (Sk)	HKP
21.10.2006	1	Fredshög (Sk)	Ola Elleström, Nils Kjellé
27–31.10.2006	2	Dettern (Vg)	Ulf Lindell et al.
26.12.2006	2	Ulricehamn (Vg)	Claes-Göran Ahlgren
15.3.2007	1	Faludden (Gtl)	Per Smitterberg
22–25.3.2007	1	Yttre Stockviken (Gtl)	Michael Tholin, Carl Tholin
28.3.2007	1	Nabben (Gtl)	Josef Andersson
15.4.2007	2	Horns båtvarv (Srm)	Nisse Nilsson
22.4.2007	2 ^{2,3}	Kyrkbingegrund (Gtl)	Michael Tholin, Carl Tholin
24.4.2007	2 ²	Lausviken (Gtl)	Carl Tholin
27.4.2007	1	Lausviken (Gtl)	Bimbi Ollberg
5.5.2007	1	Klase (Gtl)	Mikael Wänskä

¹ = Bred, paired to a Greater Canada Goose, at Gussjön (Ång) in 1989. *Häckade i par med kanadagås vid Gussjön (Ång) 1989.* ² = Different individuals. *Olika individer.* ³ = Possibly Greater White-fronted Goose x Barnacle Goose hybrids. *Eventuellt bläsgås x vitkindad gås-hybrid.*

Table A11. Bar-headed Goose x Greater Canada Goose. *Stripgås x kanadagås.*

1965	1	Kristianstad (Sk)	Axelsson (1967)
1966	1	Kristianstad (Sk)	Nordöstra Skånes rk (1968)
12.4.1980	1	Finnåkerssjön (Vstm)	Malmstigen (1980)
21.2.1984	2 ¹	Sjöbobaden (Sk)	Anders Jönsson et al.
30.9–28.10.1984	1 ²	Näsbyholm (Sk)	Anders Jönsson et al.
3.11.1984	1 ²	Skönabäck (Sk)	Anders Jönsson et al.
15.12.1984	1 ²	Fredshög (Sk)	Anders Jönsson et al.
20.2.1987	1	Kämpinge (Sk)	Anders Jönsson
3–14.6.1987	5 ³	Täkern (Ög)	Anders Elf et al.
5.9.1988	4	Kyleberg, Täkern (Ög)	Benny Ekberg
9.10.1992	1	Tosteberga (Sk)	Stig-Arne Svensson
24.3.1995	1	Händelöp (Sm)	Thomas Ewerlid
2–3.11.1996	1	Sjötorpasjön/Mönarpsområdet (Vg)	Jonas Grahn
1.11.1998	1	Barsebäckshamn (Sk)	Kent Andersson
11–25.7.2000	2	Torhamns udde (Bl)	Fredrik Lennartsson et al.
11.1.2001	1	Klagshamnsudden (Sk)	Mattias Ullman
28.3.2004	1	Vimmerby (Sm)	Gunnar Ölvingsson
16.1.2005	1 ⁴	Örtofta (Sk)	Per Lagerås

¹ = Together with a Bar-headed Goose. *Tillsammans med en stripgås.* ² = Probably the same individual. *Troligen samma individ.* ³ = Juveniles (probably 2nd cy birds) together with their parents. *Juveniler (troligen 2K) tillsammans med föräldrarna.* ⁴ = Possible. *Möjlig.*

Table A12. Bar-headed Goose x Barnacle Goose, except the pair seen in Skåne 1985–1994 and of the surviving mate that was last seen 15 September 2001. *Stripgås x vitkindad gås, utom paret som sågs i Skåne 1985–1994 samt den överlevande individ av det paret som senast sågs den 15 september 2001.*

15.12.1986	1	Karups ängar (Sk)	HKP
26.3–31.12.1990	1 ¹	Lillfjärden (Hls)	Bengt Sättlin
9.8.1990	1	Foteviken (Sk)	HKP
19.8.1997	1 ²	Marbystrand (Ög)	Messer (1999)
Oct–Nov.1997	1 ²	Himmelstalund (Ög)	Messer (1999)
24.6–12.8.1998	1	Börringe (Sk)	HKP
11–19.9.1998	1	Foteviken (Sk)	HKP
19.9.1998	1	Foteviken (Sk)	HKP
25.8.1999	1	Vellinge ängar (Sk)	HKP
15.9.1999	1	Ellestadsjön (Sk)	HKP
21.10.1999	1	Foteviken (Sk)	HKP
23.8.2000	2	Vellinge ängar (Sk)	HKP
7–11.10.2005	1	Spillepeng (Sk)	HKP

¹ = The bird had been there some years when first reported. *Fågeln hade funnits på lokalen några år då den först rapporterades.* ² = The same individual. *Samma individ.*

Table A13. Dark-bellied Brent Goose x Barnacle Goose. *Mörkbukig prutgås x vitkindad gås.*

6.10.2004	1 ¹	Vellinge ängar (Sk)	Nils Kjellén, Mattias Ullman
22.10.2005	1 ¹	Knösen (Sk)	Tommy Holmgren
25.10.2005	2	Kungstorp (Sk)	Tommy Holmgren
19.5.2006	1	Faludden (Gtl)	Johan Södercrantz, Tommy Magnusson
4.10.2006	1	Hagbyhamn (Sm)	Stig Ljungdahl
7.10.2006	1	Risinge hamn (Öl)	Mats Wallin
13.10.2006	1	Vellinge ängar (Sk)	HKP, Peter Greenstreet
14–21.10.2006	1	Knösen, Skanör (Sk)	Max Lundberg et al.
17–21.10.2006	1	Barsebäck (Sk)	HKP, Anders Jönsson
20.10.2006	1	Kämpinge (Sk)	HKP

¹ = 1st cy. *IK.*

Table A14. Greater Canada Goose x Barnacle Goose, through 1994, except breeding and winter observations. *Kanadagås x vitkindad gås till och med 1994, utom häcknings- och vinterobservationer.*

29.10.1969	1	Ottenby (Öl)	Lars Brolund
24.9.1977	2	Vendelsjön (Upl)	Kenneth Pless, Thomas Pless
3–16.11.1983	1	Norje/Vesan (Bl)	Thomas Nilsson
1–2.5.1984	1	Säby, Täkern (Ög)	Kent Elwer
20.10.1985	1	Farhult (Sk)	Peter Svensson
9.5.1987	1	Överenhörna (Srm)	Stefan Classon, Johan Ehrlén
13.3.1988	1	Starby (Sk)	Henrik Johansson, Mats Rellmar
10.9.1988	1	Rönnen (Sk)	Johan Hammar
17.8–22.9.1989	1	Erstavik (Srm)	Johan Larsson
24.9–19.11.1989	3	Norra Aspen (Srm)	Mats Gothnier
1.10.1989	1	Björnsättersviken (Vg)	Torbjörn Gustafsson et al.
13.10.1989	1	Ymsen (Vg)	Torbjörn Gustafsson et al.
26.4.1990	1	Löddesnäs (Sk)	Anders Jönsson
10.10.1990	1	Botkyrka (Srm)	Anders Löfgren
Summer–1.9.1991	1	Lillfjärden (Hls)	Bengt Sättlin, Sebastian Sundberg
28.7.1991	1	Östen (Vg)	T. Gustafsson, G. Johansson
Late autumn 1991	3	Stensjön (Srm)	Rundström (1992)
31.3.1993	1	Fåsjön (Vstm)	Roland Thuvander et al.

16.5.1993	4	Ryningenäsfälten (Sm)	Lars Johan Johansson
6.9.1993	1	Segestad (Vrm)	Torbjörn Gustafson
12.11.1993	1	Salviken (Sk)	Anders Jönsson
2.10.1994	6 ¹	Skanssjön (Vstm)	Per Eriksson

1 = Four 1st cy + two 2nd cy hybrids. 4 1K + 2 2K.

Table A15. Greater Canada Goose x Barnacle Goose, observations in December–February through February 2007. *Kanadagås x vitkindad gås. Observationer under december–februari till och med februari 2007.*

29.1.1986	2	Fjellie (Sk)	Anders Jönsson
25.12.1987	1	Sandön (Sk)	Mats Rellmar, Henrik Johansson
25.2.1989	1	Starby (Sk)	Anders Jönsson
17.2.1991	1	Hittarp (Sk)	Ingemar Andell, Lars-Erik Jönsson
17.2.1991	1	Kungstorp (Sk)	Ingemar Andell, Lars-Erik Jönsson
17.1.1993	4	Barsebäckshamn (Sk)	Anders Jönsson
18.12.93–10.2.94	1	Elleholm/Fäholmen (Bl)	Thomas Nilsson, Patrik Österblad
27.2.1997	1	Västsurå (Vstm)	Ralf Lundmark
21–26.2.1998	1–2	Lagårdssjön (Vstm)	Markus Rehnberg
26.2.2000	5	Östen (Vg)	Torbjörn Gustafson, Lena Kempe
17.12.2000	1	Ulricehamn (Vg)	Jan Andersson
5.12.2002	1	Ramdalaslättan (Bl)	Fredrik Lennartsson
9.1.2005	1	Roxen (Ög)	Oscar Haraldsson
16.1.2005	2	Örtofta (Sk)	Per Lagerås
19.1.2005	6	Gödastorp (Hl)	Joakim Hagström
22.1.2005	1	Skottorps våtmark (Hl)	Sonja & Klas Henningsson
11.12.2005	1	Petersborg (Sk)	HKP
27.12.2005	2	Stockholms ström (Upl)	Filippa Ek
4.1.2006	1	Stockholms ström (Upl)	Niklas Henriksson et al.
9.2.2006	2	Stockholms ström (Upl)	Ingvar Skoog
1.12.2006	1	Roxen (Ög)	Fredrik Broms
27.12.2006	6	Lagårdssjön (Vstm)	Ralf Lundmark
1.1.2007	8	Kvismaren (Nrk)	Anders Jacobsson
13.1.2007	1	Östra Odarslöv (Sk)	HKP
17.1.2007	1	Torsjön (Sk)	HKP
21.2.2007	1	Kirseberg (Sk)	Kaj Svahn

Table A16. Lesser Canada Goose x Barnacle Goose. *Dvärgkanadagås x vitkindad gås.*

17.11.1998	1	Foteviken (Sk)	HKP
15.9.2000	6	Foteviken (Sk)	HKP
23.9.2000	2	Foteviken (Sk)	HKP
13.10.2001	3	Vombs ängar (Sk)	HKP
17.10.2001	2	Barsebäck (Sk)	HKP
13.11.2001	1	Trolleberg (Sk)	HKP
1–20.5.2002	1 ¹	Hjälstaviken (Upl)	Ulf Larsson, Tom Sandström
20.10–14.11.2004	1	Värpinge/Kronotorp (Sk)	HKP
13.9–12.10.2005	1 ²	Foteviken (Sk)	HKP
15.9.2005	2 ³	Fulltofta (Sk)	HKP
11–18.10.2005	1 ¹	Ärike Fyris (Upl)	Johan Södercrantz et al.
17.4.2006	1 ¹	Bergs mader (Dsl)	Per Karlsson Linderum
10.9.2006	1	Vellinge ängar (Sk)	HKP
7–12.10.2006	2 ³	Vombsjön (Sk)	HKP, Peter Greenstreet
8.10.2006	1 ¹	Ottenby (Öl)	Pav Johnsson
17.10.2006	1	Barsebäck (Sk)	HKP
20.10.2006	2 ³	Kämpinge (Sk)	HKP

20.11.2006	2 ³	Bodarp (Sk)	HKP
23.12.2006	1 ¹	Södra Sallerup (Sk)	Stefan Cherrug
22.1.2007	1	Annexdal (Sk)	HKP

¹ = Probably this cross. *Förmodligen denna korsning.* ² = Together with partner and one young. *Tillsammans med partner och en unge.* ³ = The same individuals. *Samma individer.*

Table A17. Barnacle Goose x Red-breasted Goose. *Vitkindad gås x rödhalsad gås.*

19.4–20.5.1978	1 ¹	Faludden (Gtl)	Jonsson (1979)
18.10.1979	1 ¹	Ottenby (Öl)	Wallin (1995)
22.4.1983	1	Närsholmen (Gtl)	Per Smitterberg
27.4.1984	1	Grötlingboudd (Gtl)	Pierre Unge
21–23.4.1995	1 ²	Närsholmen (Gtl)	Jörgen Petersson, Per Smitterberg
25.4.1995	1 ²	Hablingbo (Gtl)	Björn Andersson, Tord Lantz
19.4–1.5.1997	1	Faludden (Gtl)	Per Smitterberg et al.
11–12.10.1997	1	Enetri (Öl)	Kalle Brinell
25.4.1998	1	Valjeviken (Bl)	Mats-Åke Persson, Christian Persson
14.10.2004	1 ³	Faludden (Gtl)	Per Smitterberg
14.10.2005	1 ⁴	Bottorpsslätten (Sm)	Peter Sieurin
22.10.2005	1 ^{4,5}	Knösen (Sk)	Tommy Holmgren
22.10.2005	1 ^{4,5}	Eskilstorps ängar (Sk)	Mattias Ullman
28.3–4.4.2007	1 ³	Nabben (Gtl)	Bimbi Ollberg

¹ = Probably the same individual. *Troligen samma individ.* ² = Probably the same individual. *Troligen samma individ.* ³ = Adult. *Adult.* ⁴ = Probably the same individual. *Troligen samma individ.* ⁵ = 1st cy bird. *IK.*