

Variation in bill colour among Greylag Geese *Anser anser* breeding in south-west Scania

HAKON KAMPE-PERSSON

Abstract

The *anser* subspecies of the Greylag Goose *Anser anser* was earlier distributed over most of Europe, between the ranges of *sylvestris* in the west and *rubirostris* in the east. Its bill colour was orange. I examined the bill colour of 97 trapped breeding adults from the province of Scania in 1995–1998. I used a six-grade scale from orange (I) to pink (VI). Most birds were intermediate (III), a few had pink bills (V–VI), but none had an orange one (I). Two explanations are examined: fauna falsification by introduction of *rubirostris* birds, which is known to have taken place

several times, and inclusion of *rubirostris* genes into the small 20th century population of *anser* birds by *rubirostris* individuals that have reached the *anser* range naturally; a few such winter visitors are known. I conclude that the most likely explanation is the deliberate introduction of *rubirostris* but the other alternative cannot yet be ruled out.

Hakon Kampe-Persson, Department of Animal Ecology, Ecology Building, SE-223 62 Lund, Sweden.
E-mail: hakonpersson@hotmail.com

Received 5 June 2003, Accepted 19 August 2003, Editor: S. Svensson

The Greylag Goose *Anser anser* has a large breeding range, extending from Iceland across Europe, southern Siberia and north-central Asia to the Pacific, and from northern Norway to southern Turkey (Kampe-Persson 2002). Three subspecies are recognized; *sylvestris* in Iceland, Scotland and Norway, *rubirostris* from south-east Europe and eastwards, and *anser* in the range situated in between. Reportedly, the bill is orange, with some pink only behind the nail and along the cutting edges, in the western part of the species' range, and wholly pink in the eastern part (Cramp & Simmons 1977). The border between orange-billed *anser* and pink-billed *rubirostris* evidently is situated somewhere in Hungary (van den Bergh 2002).

The Greylag originally bred over the whole of Europe, before excessive hunting and habitat destruction led to a disjunct distribution. The population sizes were probably at their lowest in the 1920s and 1930s. In Scania, for instance, there were only between 20 and 25 breeding pairs in the early 1930s, chiefly at fish-ponds in Perstorp (Rosenius 1937). During the last 50 years, there have been large increases in numbers and range in Europe, mainly owing to reduced persecution and improved feeding conditions throughout the year (Kampe-Persson

2002). The Swedish population, for instance, increased from 200–300 pairs to c. 25,000 pairs during the last half a century. The restoration of the former breeding range was assisted by introductions in many areas, often involving non-native birds.

In south-west Scania, a long-term study of the breeding ecology of the Greylag Goose was launched in 1985 (Nilsson 1998). Notwithstanding the study population was not established until in the late 1960s and early 1970s, it had grown to 910 breeding pairs in 2001 (Nilsson 1998, Nilsson *et al.* 2002). Greylag Geese breeding in Scania before the population decline were described as orange-billed (Nilsson 1858). Under the present circumstances, having recovered from such an extremely low population size, it might be justified to ask: Do also today's breeders in Scania have orange bills?

To check this, bill colour was determined according to a six-graded scale, ranging from orange to pink (Hudec & Rooth 1970), while neck-collaring Greylag Geese in the study area in 1995–1998 (Persson 2000). In total, data were obtained from 97 breeders at Lakes Klosterviken, Börringesjön, Fjällfotasjön and Yddingen. There was no significant difference in bill colour between the sexes ($\chi^2_3=5.51$, $P>0.1$). The majority of the birds had an intermediate bill colour,

a few had a pink bill, but none had an orange one (Figure 1). With a generous definition of the word orange, most intermediates might be included in the 19th century description of an *anser* bill, but not the pink ones. So, which is the origin of the pink bills? Two possibilities must be considered.

One possibility is that at least one male from the native range of *rubrirostris* was recruited into the study population. However, native *rubrirostris* is a rare vagrant in the East Atlantic flyway, and there is no evidence of any dispersal to this flyway. The only known large influx of *rubrirostris* was recorded during the very cold winter of 1979, when as many as 372 birds were found in The Netherlands on 24 February (van den Bergh 2002). On 20 October 2003, at least 10–15 *rubrirostris* geese staged at Skatelöv, province of Småland (Leo van den Berg, pers. comm.)

Another possibility is that the occurrence of pink bills is the result of fauna falsification. The earliest known introduction of *rubrirostris* into the breeding range of *anser* took place in May 1929, when six birds were brought from India to Kalmarsund (Berg 1930, 1937). The most famous case, however, was the introduction of six *rubrirostris* to the Zwin Reserve in Belgium in 1956 (Lippens 1966). Other introductions of *rubrirostris*, using birds from Zwin, took place in France, The Netherlands and England (Riols 1994, Sharrock 1976, Teixeira 1979). Of Greylags ringed as breeders at Zwin, 21 were recovered abroad, including two from Sweden (Lippens & Wille 1972), and a great number of the *rubrirostris* sightings along the East Atlantic flyway in the 1960s and 1970s were of Zwin birds. Also my own sightings of *rubrirostris* in Sweden, at Trolle-Ljungby on 29 October 1977 and at Södra Sandby on 8 February and 10 March 1978, probably concerned

such a bird. The Zwin *rubrirostris* later hybridised with *anser* and gradually the *rubrirostris* characteristics disappeared from this population (Nilsson *et al.* 1999). However, do these disappearing characteristics refer to both plumage and bill colour? Moreover, genetic studies showed marked differences between breeders in The Netherlands and Scania in the mid-1990s (Blaakmeer 1995).

The large mobility among breeders at Zwin strongly indicates that dispersal in at least some naturalised populations might be similar to that in native birds. Natal dispersal in the study population in Scania ranges 0–1,000 km (Nilsson & Persson 2001). There are no reports of the whereabouts of the *rubrirostris* brought to Kalmarsund, but the main wintering area of birds belonging to this local population at the time of introduction was the Guadalquivir Marismas in south-west Spain (Berg 1930, 1937).

For the time being, not only the origin of the pink bills is unknown but also when they first occurred, as well as if they occur also outside the study area. Data to show light upon these questions are scanty, especially when restricting to sources based on large samples. The examination of between 300 and 400 Greylags in Denmark in the early 20th century did not reveal a single individual with a pink bill (Schjøler 1925). In Utterslev Mose in Copenhagen during the years 1962–2003, none of the breeders and only three of the moulters had a pink bill (Henning Jensen *in litt*). On Gotland, on the other hand, 28.9% of 381 moulters examined during the years 1969–1975 were pink-billed (von Essen 1982). However, these birds came from a large area, many of them from Central Europe.

The most plausible explanation for the occurrence of Greylag Geese with pink bills in the Scanian study population is that it was brought about by fauna

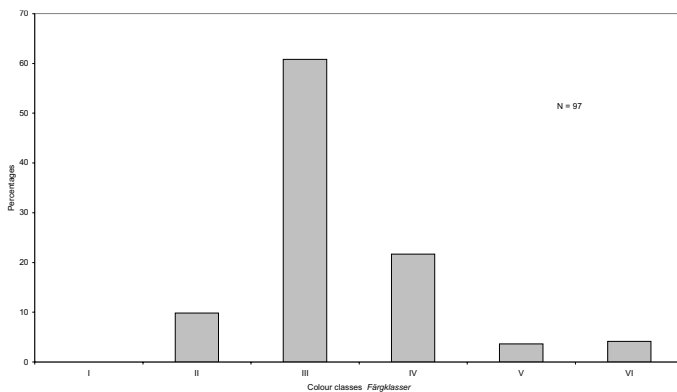


Figure 1. Division according to bill colour of breeding Greylag Geese in south-west Scania, 1995–1998. Colour classes (after Hudec & Rooth 1970) range from orange (I) to pink (VI).

Uppdelning efter näbbfärg av grågäss häckande i sydvästra Skåne åren 1995–1998. Färgskalan (enligt Hudec & Rooth 1970) sträcker sig från orange (I) till skär (VI).

falsification, and that at least one of the recruits in this area was a descendant from introduced *rubrirostris*. That a bird from the native range of *rubrirostris* dispersed to Scania is unlikely, but cannot be fully ruled out however. Detailed genetic studies might reveal the origin of pink bills, while studies in other parts of the flyway can reveal how common pink bills are. Presumably, the frequency of pink-billed individuals declines the further away one moves from sites where introductions of *rubrirostris* took place.

Acknowledgements

Members of the catching teams were Roselyne Besson, Adrie Burnett, Fred Cottaar, Peter van Haaren, Alain Kim, Annemarie Lohding, Gerhard Moll, Ana Norlén, Hanne Tatchell, Anneke Vegelin, Eric Vegelin, Jan Vegelin, Robert-Jan Vegelin, José Verbeek, Kees Verbeek and Berend Voslamber.

References

Berg, B. 1930. *De liefdesgeschiedenis van een wilde gans*. 146 pp. H.P. Leopolds Uitgeversnij N.V., The Hague.

Berg, B. 1937. *Mina försök med vildgäss*. 188 pp. P.A. Norstedt & Söners Förlag, Stockholm.

Bergh, L.M.J. van den 2002. De oostelijke Grauwe Gans *Anser anser rubrirostris*. *Vogeljaar* 50: 195–200.

Blaakmeer, K. 1995. *Genetic variation within the West European population of the Greylag goose (Anser anser)*. Sub-fase III Report, 27 pp. Animal Ecology and Population Genetics, University of Groningen, Groningen.

Cramp, S. & Simmons, K.E.L. (Ed.) 1977. *Handbook of the Birds of Europe, the Middle East, and North Africa: The Birds of the Western Palearctic*. Vol. 1, 722 pp. Oxford University Press, Oxford.

Essen, L. von 1982. De ruggande grågässen på Gotland. Pp. 45–52 in *De svenska gässen* (Svensson, S., ed.). *Vår Fågelvärld, Supplement 9*. Sveriges Ornitologiska Förening.

Hudec, K. & Rooth, J. 1970. *Die Graugans*. Die Neue Brehm Bücherie 429, 150 pp. A Ziemer Verlag, Wittenberg Lutherstadt.

Kampe-Persson, H. 2002. *Anser anser*. *Greylag Goose BWP-Update* 4(3): 181–216.

Lippens, L. 1966. Grauganseinbürgerung in Belgien. *Wild und Hund* 69: 409–410.

Lippens, L. & Wille, H. 1972. *Atlas van de Vogels in België en West-Europa*. Lanno, Tielt/Utrecht.

Nilsson, L. 1998. The Greylag Goose *Anser anser* as a model species for the study of waterfowl breeding ecology. *Acta Zoologica Lituanica, Ornithologia* 8: 20–28.

Nilsson, L., Follestad, A., Koffijberg, K., Kuijken, E., Madsen, J., Mooij, J., Mouronval, J.B., Persson, H., Schricke, V. & Voslamber, B. 1999. Greylag Goose *Anser anser*: Northwest Europe. Pp 182–201 in *Goose populations of the Western Palearctic* (Madsen, J., Cracknell, G. & Fox, A.D. eds). Wetlands International Publ. No. 48, 344 pp. Wetlands

International/National Environmental Research Institute, Wageningen/Rönde.

Nilsson, L., Green, M. & Kampe-Persson, H. 2002. Field choice in spring and breeding performance of Greylag Geese *Anser anser* in Southern Sweden. *Wildfowl* 53: 7–25.

Nilsson, L. & Persson, H. 2001. Natal and breeding dispersal in the Baltic Greylag Goose *Anser anser*. *Wildfowl* 52: 21–30.

Nilsson, S. 1858. *Skandinavisk Fauna. Foglarna*. Andra Bandet, 580 pp. Gleerups Förlag, Lund.

Persson, H. 2000. Neck-collaring of Greylag Geese *Anser anser* in Scania, 1984–2000. *Anser* 39: 167–172. (Swedish with English summary).

Riols, C. 1994. Oie cendrée *Anser anser*. Pp. 120–121 in *Novel Atlas des Oiseaux Nicheurs de France 1985–1989* (Yeatman-Berthelot, D. & Jarry, G. eds), 776 pp. Société ornithologique de France, Paris.

Rosenius, P. 1937. *Sveriges Fåglar och Fågelbon*. Vol. 4, 428 pp. Gleerups Förlag, Lund.

Schiøler, E.L. 1925. *Fugle, med Henblikk paa de i Grønland, paa Færøerne og i Kongeriget Island forekommende Arter*. Vol. 1. Nordisk Forlag, Copenhagen.

Sharrock, J.T.R. 1976. *The Atlas of Breeding Birds in Britain and Ireland*. British Trust for Ornithology, Tring.

Teixeira, R.M. 1979. *Atlas van de Nederlandse Broedvogels*. 431 pp. Vereniging tot Behoud van Natuurmonumenten in Nederland, 's-Graveland.

Sammanfattning

Näbbfärgsvariation bland grågäss Anser anser häckande i sydvästra Skåne.

Grågäsens vida utbredningsområde sträcker sig från Island till Stilla Havet, samt från nordligaste Norge till södra Turkiet. Arten representeras av tre raser; *sylvestris* i Island, Skottland och Norge, *rubrirostris* från sydöstra Europa och österut, samt *anser* i mellanliggande område. Enligt uppgift är näbben huvudsakligen orange i västra delen av utbredningsområdet och helt skär i den östra. Gränsen mellan orangefärgade *anser* och skära *rubrirostris* går någonstans i Ungern.

Grågäsen häckade ursprungligen över hela Europa, innan hänsynslös jakt året om ledde till en osammanhängande utbredning. Fåtaligast var arten på 1920- och 1930-talet, då det till exempel endast fanns 20–25 par i Skåne. Under det senaste halvselet har arten ökat kraftigt överallt i Europa; i Sverige från 200–300 par till ca: 25.000 par. Före populationsminskningen hade grågäss häckande i Skåne orangefärgade näbbar.

För att kontrollera om detsamma gäller även idag användes en sexgradig skala, löpande från orange till skär, för att fastställa näbbfärgen hos de 97 häckande grågäss som halsringmärktes i Klosterviken, Böringsjön, Fjällfotassjön och Yddingen under åren

1995–1998. Majoriteten av fåglarna visade sig ha en intermediär näbbfärg, några hade skär näbb, men ingen hade en orange. Med en generös definition av ordet orange kan de flesta intermediärerna inkluderas i 1800-talets beskrivning av en *anser*-näbb, men inte de skära. Så, vilket är ursprunget till de skära näbbarna?

En möjlighet är att minst en hane från det ursprungliga häckområdet för *rubrirostris* rekryterats till den undersökta populationen. Vilda *rubrirostris* är emellertid sällsynta gäster i den atlantiska flyttningsskorridoren, och det finns inga bevis för att någon fågel skulle ha spritt sig hit.

En annan möjlighet är att de skära näbbarna är ett resultat av faunaförfalskning. Den tidigast kända introduktionen av *rubrirostris* till häckområdet för *anser* skedde i maj 1929, då sex fåglar togs från Indien till Kalmarsund. Det mest kända exemplet däremot är introduktionen av sex *rubrirostris* till Zwin-reservatet i Belgien 1956. Ytterligare introduktioner av *rubrirostris*, utnyttjande fåglar från

Zwin, skedde i Frankrike, Nederländerna och England. Av häckande grågäss ringmärkta i Zwin återfanns 21 i utlandet, inklusive 2 i Sverige, och ett stort antal av *rubrirostris*-observationerna i den atlantiska flyttningsskorridoren under 1960- och 1970-talet gällde fåglar från Zwin. Den stora rörligheten bland häckfåglarna i Zwin är en stark indikation på att spridningsförmågan hos åtminstone några av de naturaliserade populationerna kan vara densamma som hos vilda grågäss. Ungfågelspridningen i den skånska populationen varierar mellan 0 och 1,000 km.

Den rimligaste förklaringen till förekomsten av grågäss med skära näbbar i den skånska populationen är att det förorsakades genom faunaförfalskning, och att åtminstone en av de rekryterade fåglarna i detta område var en avkomling till introducerade *rubrirostris*. Att minst en fågel rekryterats från det ursprungliga häckområdet för *rubrirostris* är osannolikt, men kan inte helt och hållet uteslutas.