

# Movements of Tundra Bean Goose *Anser fabalis rossicus* neck-banded in northern Scandinavia

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**Abstract.** Based on 1420 neck-band reports we could map the movements of Tundra Bean Geese marked in northern Scandinavia. With few exceptions, the maps show a distinct migration pattern through Sweden to the main wintering area in NE Scania. In mild winters, only a few individuals extend their migration into continental Europe, but during severe winters, a large proportion of the sightings are from Germany and Denmark.

**Key words:** Tundra Bean Goose, subspecies, migration, flyway, conservation

## INTRODUCTION

The Bean Geese *Anser fabalis* occurring in Western Europe are either of the Taiga *A. f. fabalis* or the Tundra *A. f. rossicus* subspecies (Madsen et al. 1999, Ruokonen et al. 2008, Fox et al. 2010). These subspecies are difficult to distinguish in the field (Heinicke 2004, Heinicke et al. 2005, Heinicke & Koffijberg 2010), and, particularly in regions where one of them is rare among large numbers of the other, the rare subspecies is commonly overlooked. This is also true for organised goose counts (e.g. Nilsson and Månsson 2012) where birds are counted while flying to or from a roost. Meanwhile, in observation reports (e.g. the Swedish Report System For Birds, <http://www.artportalen.se/birds/>) the rare subspecies are over-represented, because they are considered to be more exciting (de Jong 2010b). Similarly in Norway, the Tundra subspecies has been the subject of scrutiny by national and regional rarity committees, although the Taiga subspecies is now the rarer (Øien & Aarvak 2011, unpubl. data). Unfortunately, these discrepancies make subspecies level interpretations of goose counts and observation reports virtually impossible (Heinicke 2010a, Kampe-Persson 2011).

Currently, in Western Europe during winter, the Tundra subspecies is much more numerous than the Taiga subspecies: 500000–550000 and 60000–65000 individuals, respectively (Fox et al. 2010). Furthermore, the numbers of Taiga Bean Goose have shown a marked decline in recent years, while the Tundra Bean Goose population has remained relatively stable (Fox et al. 2010), and thus up-to-date subspecies level population estimates are urgently needed. With

a large proportion of the European Taiga Bean Geese staging and wintering in Sweden (Nilsson & Månsson 2012), the quality of the European population estimates depends on a reliable separation of the Bean Goose subspecies in this country. For this to happen, the Swedish ornithologists have to be convinced of the presence of Tundra Bean Geese, the less common and overlooked subspecies in Scandinavia. Neck-banded, and thus thoroughly documented, Tundra Bean Geese at Swedish staging sites, would provide evidence of the occurrence of this subspecies. Tundra Bean Goose neck-band schemes were already active in Russia, Germany and The Netherlands (Heinicke 2010b), and thus we chose to focus on the breeding population of northern Scandinavia.

The northern Scandinavian population was recently shown to belong to the Tundra subspecies (Aarvak & Øien 2009), and there is still doubt about whether it was recently established or previously misidentified as Taiga Bean Geese, since the latter still occurs in small numbers in the forested Pasvik Valley in eastern Finnmark, Norway. The breeding range of the Tundra Bean Goose is mainly in Finnmark County in northern Norway, but seems to extend into adjacent parts of Finnish Lapland and Sweden's Norrbotten County.

The linkage between the Tundra Bean Geese staging along the Gulf of Bothnia in northern Sweden in spring and the northern Scandinavian breeding population was confirmed by the observations of five birds fitted with neck-bands at Valda Marshes in Finnmark, Norway, and of two birds fitted with satellite transmitters and 30 with neck-bands in northern Sweden (Aarvak & Øien 2009, Heinicke 2010, Nilsson et al. 2010). If all the spring-staging Tundra Bean Geese in northern

Table 1. Origin, colour codes, numbers and catching periods of the Tundra Bean Geese in this study.

Site	Neck-band colour	Total	Period
Porsanger, Finnmark, Norway	Black	10	2003–2010
Luleå, Norrbotten, Sweden	Blue	29	2009–2010
Umeå, Västerbotten, Sweden	Blue	1	2009
Varanger Peninsula, Finnmark, Norway	Yellow	68	2010

Table 2. Numbers of sightings (n individuals) of neck-banded Tundra Bean Geese in September–November 2009–2011.

Site	September	October	November
Kvismaren	3 (2)	17 (6)	2 (1)
Tåkern	26 (24)	109 (32)	6 (6)
Östen	17 (16)	53 (31)	0 (0)
Kristianstad	0 (0)	1 (1)	141 (52)
Other sites	4 (2)	4 (2)	11 (2)

Sweden belong to the northern Scandinavian breeding population, its size is approximately a minimum of 2700 individuals (Heinicke 2010).

The aim of our project was to unravel the migratory pattern of the northern Scandinavian Tundra Bean Goose population and to monitor its occurrence on the Swedish staging sites.

## METHODS

On the spring staging sites in northern Scandinavia, Bean Geese were caught with cannon nets during 2003 to 2010 (Aarvak & Øien 2009, Heinicke 2010), and in summer 2010 we herded flightless moulting non-breeding birds into standing nets on the Varanger Peninsula (de Jong 2010a, Øien & Aarvak 2011). In total, 108 neck-banded Tundra Bean Geese were included in this study (Table 1). On all the sites except Valdak Marshes, Finnmark, Norway, some Taiga Bean Geese were also caught and neck-banded during the catching events. All birds were classified according to a protocol based on Alpheraky (1905), Burgers et al. (1991) and Dzubin & Cooch (1992). The birds were also photographed, and blood samples were taken for future molecular confirmation of subspecies classification.

The neck-band sightings stem from three sources: reports to the national ringing centres of birds shot or found dead, opportunistic sightings from birdwatchers and our own dedicated searches for neck-bands. Reports from birdwatchers were extracted from <http://www.geese.org>, <http://www.ringmerkning.no/cr/>, <http://www.artportalen.se/birds/> and <http://www.artobservasjoner.no/fugler/>. During catching events

and goose counts in Sweden, Norway, Denmark and Germany, we conducted intensive neck-band searches among gatherings of wintering, staging and moulting Bean Geese. Sixty five percent of the sightings originated from these activities.

## RESULTS AND DISCUSSION

By early April 2012 the data set consisted of 1420 reports of 93 birds, of which four were reported dead. Approximately 85% of the reports were from Sweden and 10% from Norway (Figure 1). The remaining reports came from Germany (n=46), The Netherlands (13), Denmark (15), Finland (3), and Estonia, Poland and the UK (1 each).

The observations suggest a marked tempo-spatial pattern (Table 2, Figure 1). During autumn migration (Sept–Oct), the main staging sites are in central Sweden: lakes Östen, Tåkern and Kvismaren. In late autumn and in mild winters (Nov–Feb), most birds gather around Lake Hammarsjön near Kristianstad in northeastern Scania, Sweden, but some individuals radiate into Denmark, Germany and The Netherlands. Spring migration starts in March and the geese use Lake Östen and Lake Tåkern as the main staging sites until mid-April, although some linger until early May. Further north, sites in Uppland and near Umeå are used by small numbers in spring, while the majority uses sites near Luleå in northern Sweden, where they stay until the first week of May. In the second and third decade of May, the birds use staging sites close to their breeding grounds in northernmost Norway and adjacent parts of Finland and Sweden. In July and August, non- and failed

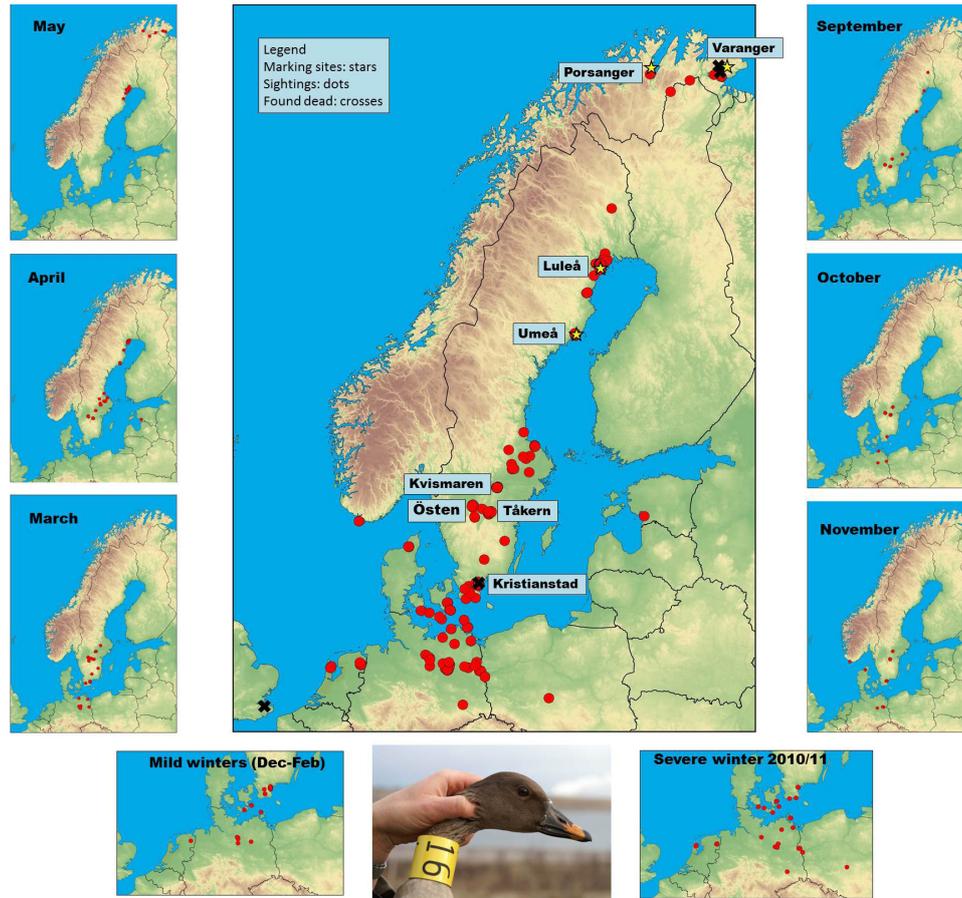


Figure 1. Catching, observation and recovery sites of Tundra Bean Geese neck-banded in Scandinavia 2003–2010. Central map: all sites. Left and right panel: monthly observations during pre- and post-breeding migration. Below: observations from mild winters (Dec–Feb 2009/2010 and 2011/2012) and a severe winter (Dec–Feb 2010/2011). Source: <http://www.geese.org>

breeders gather at the Varanger Peninsula moulting site until the onset of autumn migration. During the severe winter of 2010/2011, many Tundra Bean Geese undertook cold weather movements from Scania into Germany, Denmark and The Netherlands. Currently, the single observations from southern Norway, the UK and Estonia are difficult to fit into the main pattern, but the Estonian bird (a female ringed in northern Sweden) may indicate an alternative spring migration route. Another Swedish ringed Tundra Bean Goose (also a female) was never reported in Scandinavia, but was observed during three consecutive winters in eastern Germany and neighbouring parts of Poland, probably as a result of a pair bond with a bird from an eastern population.

Overall, the observed pattern, as well as the small number of deviations from it, strongly indicates that the Tundra Bean Goose of northern Scandinavia make up a distinct population with a specific migration pattern, well separated from the Russian Tundra Bean Geese wintering mainly in Poland, Germany and The Netherlands. Because the Scandinavian population spends most of its annual cycle in Sweden, this country

has particular responsibility for its conservation and management.

For the population estimates of the Taiga Bean Goose, the presence of significant numbers of overlooked Tundra Bean Geese in Sweden makes a downward adjustment of former estimates unavoidable. As a result, the level of conservation concern (currently classified as “Least Concern” by the IUCN) needs to be raised. We hope the Swedish goose counters will include consistent separation of Taiga and Tundra Bean Geese in their future work, so their results can be used for conservation and management purposes, at the subspecies level.

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