



AGREEMENT ON THE CONSERVATION OF
AFRICAN-EURASIAN MIGRATORY WATERBIRDS

**WORKSHOP FOR THE REVISION OF THE INTERNATIONAL SINGLE SPECIES
ACTION PLAN FOR THE TAIGA BEAN GOOSE**

1-3 April 2025, Bonn, Germany and Online

**DRAFT BIOLOGICAL ASSESSMENT AND PROBLEM ANALYSIS OF THE FINLAND AND NW
RUSSIA/SWEDEN, DENMARK AND GERMANY POPULATION OF TAIGA BEAN GOOSE –
“CENTRAL POPULATION”¹, FORMER CENTRAL MANAGEMENT UNIT²**

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In terms of the Revised Format and Guidelines for AEWA International Single and Multi-species Action Plans ([Doc. AEWA/TBG/ISSAP/Inf.1.3](#)), the annexes of each International Single Species Action Plan (ISSAP) must include both a biological assessment and a problem analysis.

For the purposes of the Taiga Bean Goose ISSAP Revision Workshop, a preliminary biological assessment and preliminary problem analysis has been prepared for each of the four populations of Taiga Bean Goose. These meeting documents have been divided by population to enable each Range State to more easily focus on those populations that occur in their countries. During the workshop, participants' input will be sought on both how best to present these assessments and analyses in the revised ISSAP (i.e., whether/how they should be merged) and how their content can be further refined and strengthened.

This document includes both the preliminary biological assessment and preliminary problem analysis for the Finland and NW Russia/Sweden, Denmark and Germany Population of Taiga Bean Goose – “Central population”.

¹ Given stakeholders' familiarity with referring to the 'Central MU', the term 'Central population' will be used for the purposes of the Taiga Bean Goose ISSAP Revision Workshop. At present, Table 1 of AEWA's Annex 3 lists this population as the 'Finland and NW Russia/Sweden, Denmark and Germany' population of *Anser fabalis fabalis*. However, a proposal will be made to AEWA MOP9 to simplify these population names to the following: 'Finland and NW Russia (br)' population of *Anser fabalis fabalis*. Assuming that the MOP adopts these amendments, the new population names will ultimately be reflected in the revised Taiga Bean Goose ISSAP.

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1. DRAFT BIOLOGICAL ASSESSMENT

1.1 Distribution throughout the annual cycle

The Central Taiga Bean Goose population breeds in northernmost Sweden, northern and central Finland, northeast Norway and in Russian Karelia, the kola peninsula and Arkhangelsk district (Figure 1, Piironen et al., 2022; Heinicke et al., 2018). The border between the Western and Central populations in northern Sweden is ambiguous, and the exact breeding distribution in northwest Russia and northeast Norway is somewhat poorly known. Non-breeders and failed breeders migrate in June to Novaya Zemlya for wing moult, successful breeders moult at their breeding sites (Piironen et al. 2021). Moulting migration to Novaya Zemlya has not been recognized in other Taiga Bean Goose populations (Rozenfeld et al., 2024; Boer 2019; Mitchell et al., 2016) and appears to be a behaviour typical only to the Central population. Most Central population taiga bean geese winter in southern Sweden and southeast Denmark, whereas some birds continue into northeast Germany and northeast Jutland (Piironen et al., 2022; Brandt et al., 2017; Nilsson, 2011).

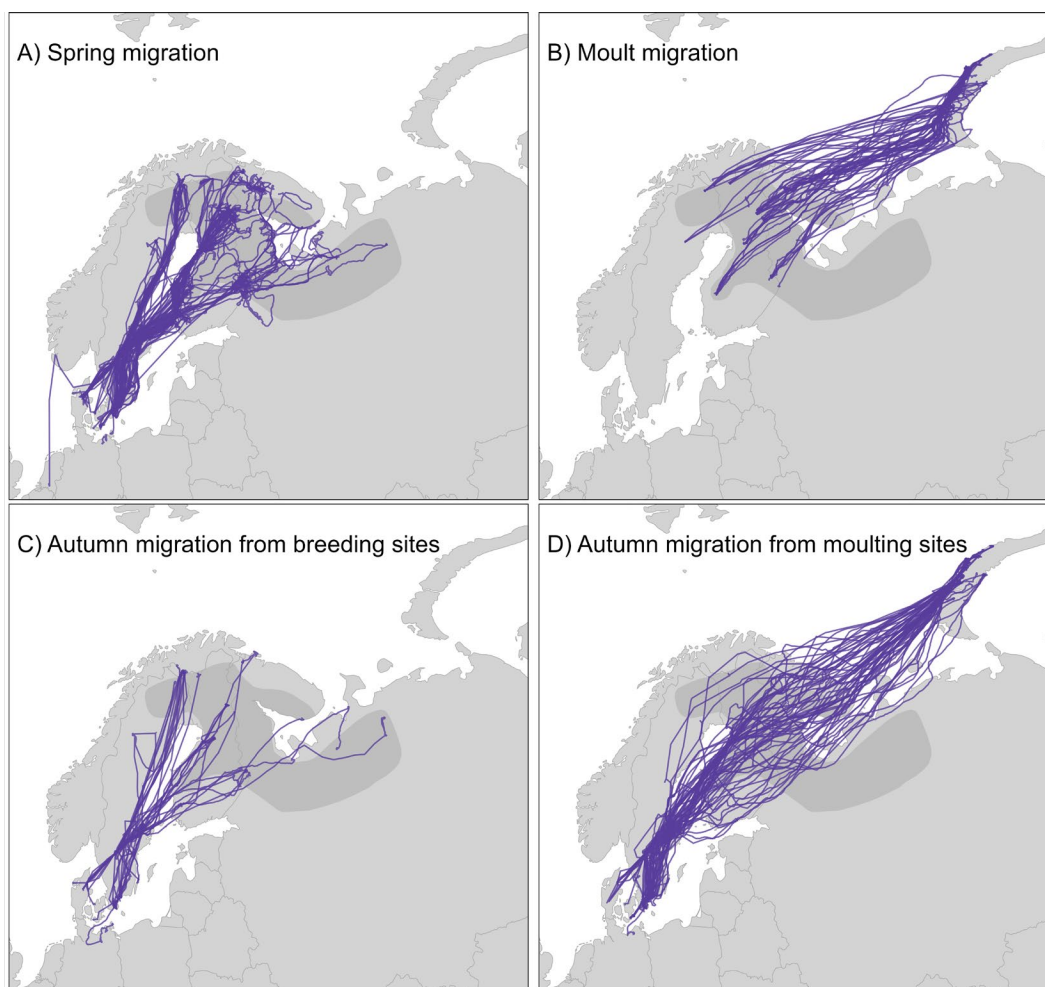


Figure 1. Movements of Central population taiga bean geese during the annual cycle visualized using satellite tracking data from birds marked in Finland and Denmark. Subplot A shows the spring migration of all birds, subplot B shows moulting migration routes of non-breeders and failed breeders, subplot C shows autumn migrations of successfully breeding birds from their breeding sites, and subplot D shows the autumn migration routes for birds moulting in Novaya Zemlya (i.e. non-breeders and failed breeders). Dark grey denotes the breeding distribution according to Heinicke et al. (2018). Maps were reproduced from the data used in Piironen et al. (2022).

1.2 Habitat requirements

Habitat requirements, selection and use of the taiga bean geese during breeding season are poorly studied. Breeding areas throughout the range are mostly characterised by a mosaic of open and wooded mires, rivers, lakes or ponds, and taiga forests. Nest can be in young or old forests as well as open or forested mires (Pirkola & Kalinainen, 1984a,b; unpublished tracking data). In Finland and Sweden, the highest densities of breeding geese have been observed in areas dominated by mesotrophic aapa flark mires (Pirkola & Kalinainen, 1984a, b; Nilsson et al., 1999). In such habitat, the mosaic water bodies provide safety from mammalian predators especially during the brood rearing and moulting period, as well as preferred plant dietary items which are available in wetlands and wooded habitats (Pirkola & Kalinainen 1984a). During the non-breeding season in Sweden, taiga bean geese mostly feed on agricultural land and roost on lakes or lake ice (e.g., Nilsson & Persson 1984). In late autumn, taiga bean geese staging in southern Sweden prefer fields with sugar beet and potato waste residues, and winter cereals become the most utilized food source in the winter (Vergin et al., 2025; Nilsson & Kampe-Persson 2013).

1.3 Survival and productivity

Taiga bean geese are thought to begin breeding at the age of three. Data on reproduction and its annual variation is scarce. Less than half of the breeding attempts seem to be successful in many years (Piironen et al., 2021; University of Turku and Natural Resources Institute Finland, unpublished data). Breeding propensity has not been studied. Intrinsic reproductive rate (reproductive rate in the absence of density-dependence) appears relatively constant across years in recent decades (Jensen et al., 2022). Proportion of juveniles in late autumn (after non-breeders have returned from the moulting sites in Novaya Zemlya) are likely the best measure of annual realized productivity. In 2009–2014, the juvenile proportion in October was 16.8–29.3% (Heinicke et al., 2018), which is at the same level with the estimates (19.3–23.4%) for years 1993–1994 (Nilsson et al., 1999). Age-specific survival estimates are not available. Based on the integrated population model for the population (Johnson et al., 2019), adult apparent survival rates increased from approximately 0.8 in 1990–2000 to approximately 0.9 after 2015. The increase coincides with decreases in harvest rates caused by substantive hunting restrictions in Finland (Jensen et al., 2023).

1.4 Population size and trend

The size of the Central Taiga Bean Goose population was estimated to 75,400 individuals in March 2023 (95% credible interval 66,800–84,800, Johnson et al., 2024). The population size fluctuated around 50,000 individuals between 1990 and 2010 and has increased since 2012. The increase in population size coincides with the increased survival, but the increase has slowed down in recent years (Johnson et al., 2024).

Table 1. Population size and trend by country

Country	Breeding numbers	Quality of data	Year(s) of the estimate	Breeding population trend in the last 10 years (or 3 generations)	Quality of data	Maximum size of migrating or non-breeding populations in the last 10 years (or 3 generations)	Quality of data	Year(s) of the estimate
<i>Russia</i>	Unknown	-	-	Unknown	-	Not available	-	-
<i>Finland</i>	Unknown	-	-	Unknown	-	24000	Good	2022

<i>Sweden</i>	Unknown	-	-	Unknown	-	73000	Good	2022
<i>Norway</i>	Unknown	-	-	Unknown	-	260	Good	2017
<i>Denmark</i>	Unknown	-	-	Unknown	-	15769	Good	2006
Overall								

2. DRAFT PROBLEM ANALYSIS

2.1. General overview

The problem descriptions are largely based on the national assessments done for the preparation of the first ISSAP for the Taiga Bean Goose population (Marjakangas et al., 2015). These assessments are supplemented with the new information acquired since the publication of the first ISSAP. In general, the Central Flyway Taiga Bean Goose population has increased substantially after the first ISSAP, which is likely a result of harvest regulations implemented after 2010. The population appears to be approaching the carrying capacity of the environment and its status should not be a major concern. However, several threats are recognized, and the extent of the various threats adversely affecting reproductive rate and habitat availability remains largely unknown.

2.2 Hunting

The bean goose is a quarry species in all countries within the Central Flyway. Implementation of the harvest regulations in Finland, Sweden and Denmark after 2010 substantially decreased harvest rates and increased survival rates of the central population taiga bean geese (Johnson et al., 2024). Survival rates are currently high (Johnson et al., 2024), and likely close to the biological maximum. Hence, it seems that harvest mortality is an important mechanism for population change in the Central Flyway, and harvest needs to be regulated to ensure favourable population status and development. Although harvest is currently managed in an international framework, some harvest of the Central Flyway birds outside the regulatory process occurs in Russia at least in spring (Natural Resources Institute Finland and University of Turku, unpublished).

2.3 Illegal harvest

Much of illegal harvest throughout the range is considered to occur because of the misidentification of goose species (see Marjakangas et al., 2015). Actual poaching, including the harvest of moulting birds outside of the season, wasn't considered to be a concern for the central population at the time the first ISSAP for the species was prepared (Marjakangas et al., 2015).

2.4 Human disturbance

Traffic on forest roads, berry picking, hiking, fishing and other recreational activities may cause disturbance especially during the moult. During the nesting period, disturbance can affect the settlement of breeding birds, ultimately reducing nesting densities, impacting upon nest-site selection, as well as later brood rearing and reproductive success (see Madsen et al. 2009). Hence, the presence of forestry, recreational and other activities in Taiga Bean Goose nesting areas can

affect reproductive output through nest abandonment or increased predation. The impacts of these disturbances are unknown.

2.5 Forestry

These changes include, for example, an increase in young successional stages of forests, the drainage of peatlands and the construction of forest road networks, all of which result in disturbance, habitat loss, fragmentation and degradation that can be detrimental for taiga bean geese. Drainage of pine, spruce and to a lesser extent open mires occurred extensively, particularly in the southern and central parts of Finland, during the 1960s and 1970s, so that nowadays c. 50% (4,7 million hectares) of all peatlands in Finland have been drained for forestry (Finnish Forest Research Institute 2000, 2013). At present, the overall area drained is no longer increasing; instead, the focus of hydrological activity is now on ditch network maintenance. Forest roads make remote areas more easily accessible than in former times and may thereby increase general access, hunting pressure and disturbance on breeding areas. These changes to the boreal forest landscape have not only caused changes in physical habitats but also altered interspecific interactions, resulting for instance in elevated predation pressure especially from generalist predators, e.g. red fox, on ground-nesting birds (e.g. Kurki et al. 1998, Ludwig et al. 2008). The direct and indirect changes caused by forestry practices are assumed to have adversely affected the breeding population of the Taiga Bean Goose, but the magnitude of this impact is not known.

2.6 Predation

Although full grown taiga bean geese may be potentially taken at any time in the annual cycle, the impact of predation is likely to be most prominent during the breeding season. Based on wildlife camera monitoring of Taiga Bean Goose nests in Finland, the most important nest predator appears to be red fox (*Vulpes vulpes*). In addition, nest predators include as least common raven (*Corvus corax*), pine marten (*Martes martes*) and wolverine (*Gulo gulo*, University of Turku, unpublished). Most Taiga Bean Goose females seem to be able to defend their nest against common ravens and martens, and they are usually unable to destroy the nest. Note, that the data on nest predation is small and therefore the list is not exhaustive, and these views should be interpreted with caution. During the nesting and brood-rearing, goslings and adults are also exposed to predation by golden eagle (*Aquila chrysaetos*), white-tailed eagles (*Haliaeetus albicilla*) and lynx (*Lynx lynx*). However, there are no studies on the natural mortality of taiga bean geese, and the relative importance of different predators as well as the overall impact of predation on the population is unknown.

2.7 Infrastructure

Number of wind farms along the Central Flyway has increased in recent years. The increases have taken place along the migration routes and at the staging, wintering, and breeding sites. In addition, substantial wind energy development is anticipated along the flyway in the future. Wind farms can cause direct mortality for geese and affect habitat use through increased disturbance. Wind energy development possess an increasing threat for taiga bean geese, but its impacts are currently unknown.

Infrastructure and industrial development associated with oil and gas as well as mining industries may cause permanent physical loss of breeding, moulting, and staging habitat. Such development encourages the increase in accessibility of formerly remote and inaccessible areas, elevating disturbance and increasing the threat of oil and other contamination.

2.8. Interspecific competition

There are observations of the aggressive behaviour by breeding whooper swans (*Cygnus cygnus*) towards taiga bean geese at the breeding sites and it has been suspected that whooper swans could compete with bean geese for the breeding habitats (Väyrynen, 2010; Kampe-Persson et al., 2005). However, there are no studies on the interactions between the two species and the impacts of growing whooper swan populations on taiga bean geese are unknown.

2.9. Exposure to radioactive substances at the moulting sites

After the publication of the first ISSAP for the taiga bean geese (Marjakangas et al., 2015) studies have revealed that non-breeders and failed breeders from the Central Population migrate almost exclusively to the island of Novaya Zemlya in Russia during summer for wing moult (Piironen et al., 2021; Piironen et al., 2022). Novaya Zemlya has been one of the most active nuclear testing sites in the world (Khalturin et al., 2004), and various types of nuclear waste have been buried in soil and shores of the island (Dahle et al., 2009). The Taiga Bean Goose moulting sites are in the proximity of the testing areas (Piironen et al., 2021). As breeding success appears to be low in many years, a large part of the Taiga Bean Goose population (likely a majority in many years) gathers annually to an area that has exposed nuclear fallouts and leaks of nuclear waste. Also, these birds are exposed to direct and indirect effects of future nuclear tests in the island. Effects of past or current exposure to radiation have not been studied, and the impacts of these threats to the population are unknown.

2.10. Diseases

Outbreaks of highly pathogenic avian influenza (HPAI) within the Central Taiga Bean Goose population have not been reported. However, substantial mortality caused by HPAI has been reported in other European goose populations (Percival et al. 2024). The Central Taiga Bean Goose population winters in a relatively small area, which makes them vulnerable for outbreaks of lethal diseases. Hence, HPAI can pose an important threat to the Central Taiga Bean Goose population.

2.11 Other threats

Given the high prevalence of embedded shot pellets in taiga bean geese in earlier years (Jönsson et al., 1985) and the residue of shot remaining in wetlands and roost sites and fields used by the birds as a source of grit, the risk of lead poisoning continues to be an issue. Most range states have introduced various types of bans on the use of lead ammunition: total ban for any hunting purposes in Denmark; any use for waterbirds is banned in Finland, in all wetlands in Germany and Sweden. In 2025, the EU Commission proposed a broader restriction to completely ban the hunting with lead shot, with a three-year transitional period. Hence, the use of lead ammunition for hunting across the range of the Central Population (except Russia) is expected to be banned in the coming years.

The consequences of natal and breeding philopatry (i.e. site fidelity) of taiga bean geese could potentially be important (Marjakangas et al., 2015). Birds marked with satellite transmitters and neckbands in Finland have shown relatively high philopatry to their natal and breeding sites (University of Turku and Natural Resources Finland, unpublished). This makes local breeding populations vulnerable to local overharvesting and habitat loss. Where local breeding populations are lost, such areas will not be readily re-colonised because of the high natal philopatry and the present. Similarly, a slow re-colonisation rate is to be expected when new breeding habitat becomes available e.g. after the restoration of previously drained mires.

Table 2. Threat assessment of the Central population following the IUCN Threats Classification Scheme ([IUCN, 2022](#))*

Population: Finland and NW Russia/Sweden, Denmark and Germany – Central population				
Threat	Scope (i.e., the proportion of the total population affected)	Severity (i.e., the overall declines caused by the threat)	Timing (i.e., past, ongoing or future)	Overall Threat Impact Score
Hunting (IUCN threat category 5.1.1 Intentional use)	Affects the whole population (>90%)	Causing or likely to cause relatively slow but significant declines (<20% over 10 years or three generations; whichever is the longer)	Only in the past and unlikely to return	
Illegal harvest (IUCN threat category 5.1.2 Unintentional effects)	Affects the minority of the population (<50%)	Unknown	<i>Ongoing</i>	
Human disturbance (IUCN threat category 6 Human intrusions & disturbance)	Affects the majority of the population (50–90%)	<i>Unknown</i>	<i>Ongoing</i>	
Forestry (IUCN threat category 5.3 Logging & wood harvesting)	Affects the majority of the population (50–90%)	<i>Unknown</i>	<i>Ongoing</i>	
Predation (IUCN threat category 12 Other options)	Affects the majority of the population (50–90%)	<i>Unknown</i>	<i>Ongoing</i>	
Infrastructure (IUCN threat category 3.3 Renewable energy)	Affects the majority of the population (50–90%)	<i>Unknown</i>	<i>Ongoing</i>	
Interspecific competition (IUCN threat category 12 Other options)	<i>Unknown</i>	<i>Unknown</i>	<i>Ongoing</i>	
Exposure to radioactive material (IUCN threat category 9.2 Industrial & military effluents)	Affects the majority of the population (50–90%)	<i>Unknown</i>	<i>Ongoing</i>	
Diseases (IUCN threat category 8.2 Problematic native species/diseases)	<i>Unknown</i>	<i>No declines</i>	<i>Future/ongoing</i>	

*To be completed during the workshop following participants' inputs on scope, severity and time columns.

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