Taiga Bean Goose
(*Anser fabalis fabalis*)

AEWA European Goose Management Platform

EGMP Technical Report No.14
Population Status Report 2018/2019

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Prepared by the AEWA European Goose Management Platform Data Centre

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Contents

Summary

This report compiles annual monitoring data on the population status of the four Management Units (MUs) (Western, Central, Eastern1 and Eastern2) of Taiga Bean Goose for the season 2018/2019. Monitoring data are used to assess the population development and provides input for the modelling of an optimal harvest strategy for the Central MU for the coming hunting season (2019/2020). The latter is part of an adaptive harvest management framework set up to support the implementation of the AEWA International Single Species Action Plan (ISSAP) for the population. The population has been estimated at three different times of the year: October, mid-winter and March for the Central MU, but only during mid-winter for the Western MU. The population size in January 2019 was c. 1,350 individuals for the Western MU and c. 41,900 individuals for the Central MU, whereas the population size for the two Eastern MUs remain unknown. In the Central MU, the October count estimated 63,000 – 68,000 Taiga Bean Geese (including birds from Western MU) and the March count estimated c. 59,400 Taiga Bean Geese.

Currently up to date harvest data at sub-species level are not available for either for the three harvested MUs.

1 Aim

The aim of this report is to compile and review the available annual monitoring data upon which to assess the population status of the Taiga Bean Goose *(Anser fabalis fabalis)* for the season 2018/2019. The data have been compiled to establish the population size and trend of each of the four MUs, i.e. Western, Central, Eastern1 and Eastern2 (Figure 1), of the Taiga Bean Goose, as well as providing specific data for input to the modelling and assessment of an optimal harvest strategy for the Central MU for the forthcoming hunting season (2019/2020). This is part of an Adaptive Harvest Management (AHM) framework[1] established to support the implementation of the AEWA ISSAP for the population (Marjakangas et al., 2015). We thank the national goose monitoring networks who contributed to this report.

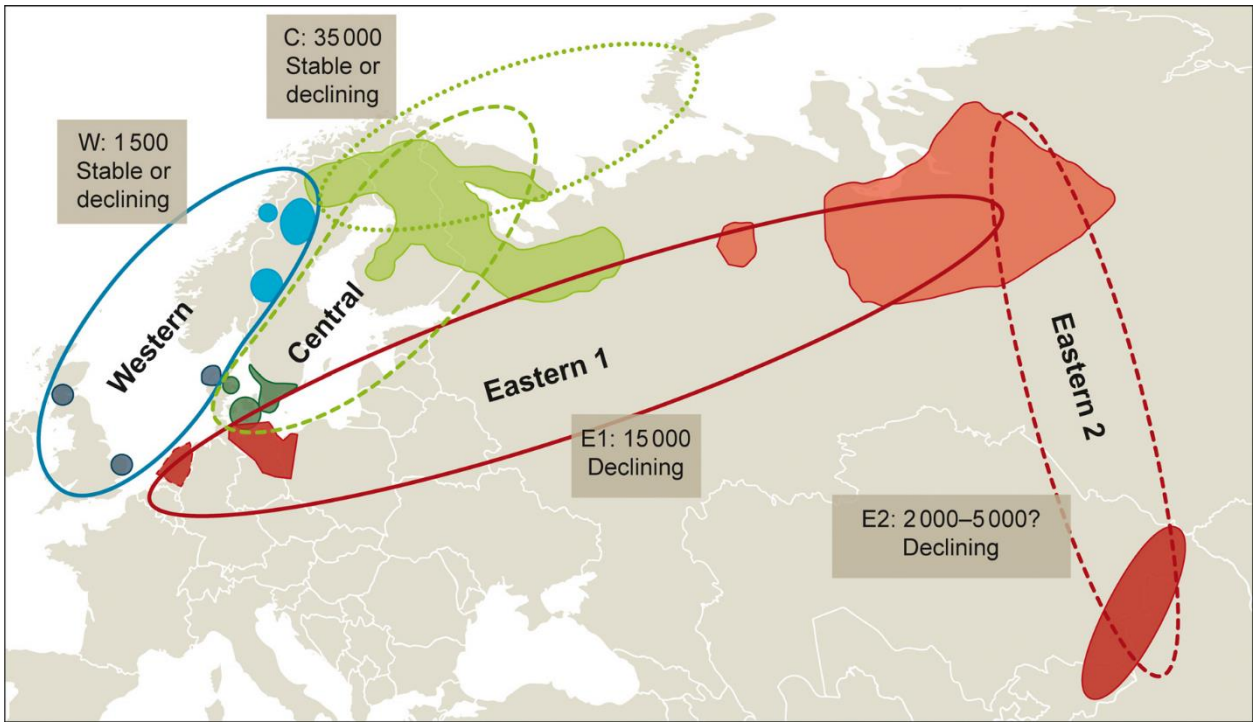

Figure 1. The four MUs of Taiga Bean Goose: Western, Central, Eastern1 and Eastern2 (dotted line indicates linkages between breeding areas in norther Fennoscandia and known moulting areas in Novaya Zemlya and the Kola Peninsula)

Range States for the Western MU: **Norway*** (b), **Sweden*** (b), **Denmark** (w), **UK** (w)
Range States for the Central MU: Russia (b), **Finland** (b), northern **Norway**** (b), northern **Sweden**** (b), **Denmark** (w), **Germany***** (w), **the Netherlands***,**** (w), Poland*** (w), southern **Sweden** (w)
Range States for the Eastern1 MU: Russia (b), **Germany** (w), **the Netherlands**** (w), Poland (w), southern **Sweden*** (w), **Belarus** (m), **Estonia** (m), **Latvia** (m), Lithuania (m), **Ukraine** (m)
Range States for the Eastern2 MU: Russia (b), China (w), Kazakhstan (w), Kyrgyzstan (w)

Range States marked in bold = EGMP Range States

b = primarily breeding Range State
w = primarily wintering Range State
m = primarily migrating/staging Range State

* Small numbers may be wintering here
** The border between the Western and Central MU breeding birds in northern Norway and northern Sweden is unclear
*** Cold winter refuge
**** It is unclear whether the birds observed in the Netherlands belong to the Central or Eastern1 MU, the numbers are however very low

[1] It should be noted that until reliable and up-to-date population and harvest data are available on an annual basis, it is not possible to establish an adaptive harvest management program.

2 Western MU

2.1 Population Estimates and Productivity

Population estimates for the Western MU of Taiga Bean Goose, consist of counts from north of Limfjorden in North Jutland in Denmark, as well as from England and Scotland in the United Kingdom.

2.1.1 Denmark

Goose monitoring in Denmark is coordinated as part of the national nature monitoring programme NOVANA (data recorded online into fugledata.dk), supplemented with observations from BirdLife Denmark's citizen science portal DOFbasen.dk. The programme contributes to the mid-winter International Waterbird Census (IWC) coordinated by Wetlands International. The IWC count in 2019 took place on and around the weekend of 12-13 January, but data from DOFbasen.dk improved the coverage of the north-western parts of Denmark, where this population is found. Based on these counts from January 2019 there were 1,094 Taiga Bean Geese (635 from the IWC count and 459 supplemented from DOFbasen), 0 Tundra Bean Geese and 0 unidentified Bean Geese in Jutland, northwest of Limfjorden (Thy, Hanherred and Morsø; Table 1).

Estimates for Denmark are currently preliminary, because there might be a few observers who have not yet entered their registrations in fugledata.dk and DOFbasen.dk. Bean Geese in North Jutland are notoriously very difficult to locate, which may partly explain the large increase compared to the numbers in 2018, which was considered to have not covered all the geese thought to be present in this area (Jensen et al 2018).

2.1.2 United Kingdom

The Bean Goose counts in the United Kingdom also contribute to the international counts coordinated by Wetlands International. In Scotland and England, the counts are carried out regularly throughout the winter months and, instead of relying on a January count, a maximum winter count (which can be any month, including the January count) is used as the final estimate.

A maximum of 241 Bean Geese was counted at Slamannan, Falkirk, Scotland on both 23 October 2018 and 11 February 2019. The first bird in Scotland was seen on 27 September 2018, with 40 counted on 29 September 2018. The last 22 birds were seen on 18 February 2019. Twenty-one birds were counted at Yare Valley, Norfolk, England on 15 December 2018. The first 16 birds were counted on 26 November 2018 and the last four birds were seen on 20 January 2019. Counts are made in a collaboration between the Wildfowl & Wetlands Trust (WWT), the Bean Goose Action Group Scotland (BGAG) and the Royal Society for the Protection of Birds (RSPB).

There is no evidence that the Bean Geese wintering in Scotland move back to the continent before 'spring migration' in the second or third week of February, so they are unlikely to be counted in both countries. The Norfolk birds leave earlier with the last birds seen on 20 January 2019. However, on 14 January 2019, one day after the counts in Denmark, there were still 15 Bean Geese in the Yare Valley, Norfolk.

Results from ringing and re-sightings suggest very little (if any) within-winter movement of Taiga Bean Geese to/from continental Europe (Mitchell et al., 2016), which means that adopting this count approach poses little risk of double counting. The population estimate for the United Kingdom was 262 individuals in 2018/2019 (Table 1).

2.2 Harvest

Taiga Bean Geese from the Western MU are protected from hunting in the UK and technically protected from hunting in Denmark by a hunting ban in the Western MU.

2.3 Conclusions for the Western MU

2.3.1 Population Estimates

A total of 1,356 individuals were counted in the Western MU in 2018/2019. There are, however, some parameters that might influence the estimated number:

1) Estimates from Denmark are currently preliminary.
2) Bean Geese in North Jutland are very difficult to locate; hence some flocks might be missing during the counts. Data gathered from telemetry devices fitted to Western MU Taiga Bean Geese in NW Jutland showed them using wetlands and natural habitats well away from roads and human habitation that are not normally extensively searched during count periods and which are unlikely to be found by birdwatchers without a specific interest in locating these birds.
3) In recent years, numbers accounted for during mid-winter counts in the Central MU have fallen below those generated by surveys undertaken at other times of the winter season. For instance, both the spring and autumn counts of Central MU Taiga Bean Geese are (consistently) recording more geese (as well as following a pattern of a modest upward trend), which is not replicated in the mid-winter count. Telemetry tagged Western MU Taiga Bean Geese are known to associate with Central MU birds at staging areas, for instance in the Östen/Ymsen area in autumn and spring. However, Bean Geese were never found in large numbers in this area of Sweden during winter and the deficit between October counts and January counts is most certainly due du migration to northern Germany from Sweden.
4) The rather mild weather conditions that pre-vailed prior to the mid-winter census might influence temperature-driven movements. Although it is also not beyond the bounds of possibility that increasing numbers of birds are wintering further up the flyway (for instance in Sweden or Norway), less than 100 *fabalis* were counted in the part of Sweden expected to host birds from the Western MU in the mild winter and even fewer in "normal winters".

Despite the potential gaps in survey coverage, the population level remains far below the short-term target (for the next 20 years) of 4,000 individuals, specified in the ISSAP (Marjakangas et al., 2015).

Table 1. Results of international count of Bean Geese in the Western MU in winter 2018/2019

Country	**Area**	**Period**	**Number of Bean Geese**			**Reported by**
			Taiga	**Tundra**	**Unidentified**	
Denmark*	NW Jutland	5-20 Jan 2019 (main 12-13 Jan)	1,094	0	0	Preben Clausen & Tony Fox, Aarhus University
UK	Slamannan, Scotland	23 Oct 2018 and 11 Feb 2019	241	-	-	Carl Mitchell/ BGAG/RSPB
	Norfolk, E England	15 Dec 2018	21	-	-	
		TOTAL	1,356	0	0	

* Preliminary totals

3 Central MU

Population estimates in the 2018/2019 season were based on monitoring in October, mid-winter and again in early March. The different counts were performed at different sites (countries) to match the distributional movements during winter.

October population estimates for the Central MU of Taiga Bean Goose consist of counts in Sweden, where the majority of birds from the central MU are found during October, with additional information from Finland and Denmark.

Winter population estimates for the Central MU of Taiga Bean Goose consist of counts from southern Sweden, the Netherlands and Denmark (i.e. including Vendsyssel, Himmerland and further south and east, but excluding the area northwest of Limfjorden in Jutland described above). All birds in Sweden and the Netherlands were identified as Central MU birds. Geese from the Central MU also winter in north-central Germany, depending on the severity of winter weather. Since there are no official organised counts with a discrimination of sub-species nor MUs in Germany, it has not been possible to obtain population estimates from Germany in January 2019.

The spring population estimate is, as the October count, mainly comprised of figures from Sweden with additional information from Norway, Denmark and Finland. The timing of this monitoring is highly dependent on the advance of the spring. The optimal monitoring occurs when the vast majority of the birds are found in Sweden. This year it occurred during two consecutive weekends, 2-3 March and 9-10 March 2019.

Productivity data are also available from Sweden.

3.1 Population Estimates

3.1.1 Sweden

The Bean Goose counts in Sweden are part of the contribution to international counts coordinated by Wetlands International, which are performed throughout the winter, although of these only the January counts of Bean Geese are separated into Taiga and Tundra Bean Geese. In Sweden, the central counting areas are divided into south-west Scania, north-east Scania and north of Scania. In south-west Scania, Bean Geese have always been separated into sub-species, whereas in north-east Scania and north of Scania the observers have only recently (since 2014) been trained and asked to record numbers on the basis of this distinction. While most Bean Goose counts separate between the two sub-species (30,534 Taiga Bean and 1,148 Tundra Bean Goose), there is, however, still a number of geese unidentified to sub-species (7,488 in total; see Table 3). The majority of these birds was most certainly Taiga Bean Geese (Nilsson 2018). As a reasonable estimate of the sub-species ratio among the unidentified geese in 2019, we used the ratio between the geese identified to the sub-species level. Hence an additional 7,217 (7,488 x 30,534/ (30,534 + 1,148)) Taiga Bean Geese were included, and the population estimate for Taiga Bean Goose in Sweden in January 2019 was c. 35,800 Taiga Bean Geese (Table 3).

In October and again in March (timing of survey depending on how cold and long the winter is) almost the whole population of the Central MU Taiga Bean Geese is staging in Sweden.

In October, the Bean Geese of both sub-species were mainly found in south-central Sweden with a concentration of the geese in staging areas like Lake Tåkern, Lake Kvismaren, Lake Östen, Hjälstaviken (Nilsson 2019). The number of Taiga Bean Goose were counted to c. 58,900 birds, Tundra Bean Goose to 3,040 and 445 as unidentified Bean Goose (Kampe-Persson 2018). By adding information from sites with smaller numbers of Bean Goose we get an additional number of unidentified Bean Geese, altogether c. 6,300. The majority of these unidentified geese could be Taiga Bean Geese and thus the population estimate for Taiga Bean Goose in Sweden in October 2018 can be set at 60,000 – 65,000 (Table 2).

In January, the majority of the total c. 38,000 Taiga Bean Geese are found in the southernmost province of the country, Scania with regularly flocks of wintering Bean Geese (mainly Taigas) in the province of Halland. In

mild winters some smaller flocks can remain on staging areas further north in south Sweden. This was the situation in January 2019, when some flocks were found in Småland and on Öland (Nilsson 2019).

In March, the majority of the Taiga Bean Geese stayed in south-central Sweden during a cold period, with very little northward movements to Finland after they had left the wintering grounds during the last half of February. The number of Taiga Bean Goose was estimated at 59,400 birds (Table 4).

Age structure among observed Bean Geese

In early autumn, it is possible to separate yearling Bean Geese from older individuals. This opportunity was used to get a measure on the productivity of the staging Taiga Bean Geese in south Sweden. Some flocks of Taiga Bean Geese were scanned during the special October surveys.

In addition to population counts, the productivity was assessed in southern Sweden, where 1,452 Taiga Bean Geese where checked for young in late October. Of these, 116 were yearlings and 1,336 adults, i.e. the proportion of young birds was 8% in the flocks checked, which is comparable to the estimated 7% in the similar estimate in the 2017 autumn (Kampe-Persson 2018: Nilsson 2019). When trying to estimate the annual yearling production, several biases need to be considered. For example, there is a risk that the migration of successful pairs (with yearlings) is different from unsuccessful pairs and an estimation of only parts of a flock often results in a higher estimated ratio of juvenile birds than if all birds in a flock are checked. It is noticeable that the 7-8% rate of yearlings is considerably lower than the estimated yearlings percentage (c. 17-28%) recorded in central and southern Sweden in October 2009-2013 (Marjakangas et al. 2015). All values are probably within the expected variation but there is a need for more detailed studies of the annual production of Taiga Bean Geese.

3.1.2 Finland

In October, casual records from Tiira.fi were used to estimate the number of staging Taiga Bean Goose in Finland. A total of 7,172 Bean Goose was counted (when using maxima for each site). 1,685 birds were identified as Taiga Bean Goose, 642 as Tundra Bean Goose and the remaining 4,845 as unidentified. Of the latter group, 528 birds were determined as Tundra Bean since they were recorded in a well-known Tundra Bean staging area in South-eastern Finland. The percentage of the two sub-species was estimated as number of Taiga Bean (1,685), (new) number Tundra Bean (642+528=1,170), so 1,685/2,855=59% of birds are Taiga Bean Geese and the rest (41%) are Tundra Bean Geese.

To only include birds observed in Finland roughly at the same time when Bean Geese were counted in Sweden, only records from 12 to 15 October were included. The number of Taiga Bean Geese from these observation is 427, Tundra Bean Geese 500 and unknown 4,069. Using the calculated ratio between the two sub-species we can calculate that (0.59*4,069) + 427 = 2,827 Taiga Bean Geese were observed in Finland during the count period in Sweden.

3.1.3 Denmark

In Denmark, there was no coordinated count in October. Instead we used casual records from Dofbasen.dk from a week before and a week after the preferred counting weekend of 13-14 October 2018, hence 6-21 October 2018. If there were multiple counts from the same site, we used the estimated number from the closest date to the preferred weekend. In cases of multiple records from the same day we used the maximum number. Unidentified Bean Geese were estimated to sub-species under the assumption of the ratio of unidentified Bean Geese to be similar to the ratio of the identified sub-species. The October 2018 count in Denmark recorded 89 Taiga Bean Geese and 115 Tundra Bean Geese (Table 2).

The January 2019 count in Denmark (excluding the region used by the Western MU) recorded 4,119 Taiga Bean Geese, 3,928 Tundra Bean Geese and 198 unidentified Bean Geese. In an attempt to assign the unidentified Bean Geese to sub-species, the following methods have been applied:

- The Bean Geese unidentified to sub-species from north-eastern Jutland have been assigned to Taiga Bean Geese on the basis of the study of sub-species within this particular region (Brandt et al. 2017).

- The remainder of the unidentified Bean Geese in 2019 elsewhere in Denmark were only found in south-east Denmark (former Storstrøms Amt: Municipalities of Vordingborg, Guldborgsund and Lolland) or adjacent areas. These were all assigned to sub-species on the basis of the ratio of identified Taiga to Tundra Bean Geese in the total annual counts in the former Storstrøms Amt.

The total for Denmark was thus estimated to be 4,175 Taiga Bean Geese in January 2019 (Table 3).

3.1.4 The Netherlands

The national goose counts in the Netherlands, including those for Bean Geese contribute to the international counts coordinated by Wetlands International and are performed during monthly counts from September to May. Specifically, for Taiga Bean Goose, also non-systematic observations from the portal www.waarneming.nl have been used. The January total from the Netherlands was 0 in 2019 (Table 3).

Recent results from telemetry and re-sightings of collared Taiga Bean Geese marked in north-eastern Jutland, Denmark show that the remnant wintering Dutch birds currently belong at least partially to the Central MU. The telemetric data still provide information on local movements, staging areas, as well as migratory movements and breeding sites (O. Therkildsen unpubl. data).

Table 2. Results of international counts of Bean Geese in the Central MU in October 2018 *

Country	**Area**	**Period**	**Number of Bean Geese**			**Reported by**
			Taiga	**Tundra**	**Unidentified**	
Sweden	Sweden	Oct	58,913	3,040	6,344	Leif Nilsson
		Estimation	60,000 - 65,000			
Finland	Finland	12-15 Oct	427	500	4,069[2]	Tiira.fi, Antti Piironen
	Estimated sub-species		2,400	1,669		
	SUM		2,827	2,169		
Denmark	Lille Vildmose	12-15 (6-21) Oct	67	2		DOFbasen.dk, Preben Clausen
	Outside Lille Vildmose		16	83	36[3]	
	Estimated		6	30		
	SUM		89	115		
Germany	north-central Germany	NA				
the Netherlands		Oct	0	4,548	226	
		TOTAL	**63,000 – 68,000**	**5,635**		

* Grey colours: Numbers before unidentified geese have been assigned

[2] The sub-species for the 4,069 unidentified Bean Geese are estimated on the assumption that the ratio between the two sub-species was similar to the ratio of identified sub-species in October (also see text)

[3] The sub-species for the 36 unidentified Bean Geese are estimated on the assumption that the ratio between the two sub-species was similar to the ratio of identified sub-species (outside Lille Vildmose)

Table 3. Results of international counts of Bean Geese in the Central MU in winter 2018/2019*

Country	Area	Period	Number of Bean Geese			Reported by
			Taiga	Tundra	Unidentified	
Sweden	S Sweden Estimated	Jan	30,534	1,148	7,488[4]	Leif Nilsson
			7,217[1]	271[1]		
			37,751	1,419		
Denmark*	Outside SE DK	Jan	2,589[5]	14	128	Preben Clausen & Tony Fox
	Estimated		36	92		
	SE DK		1,530	3,914	70[6]	
	Estimated		20	50		
			4,175	4,070		
The Netherlands		Jan	1	127,936	16,760	Kees Koffijberg
	Estimated			16,760		
			1	144,696[7]		
TOTAL			**41,927**	**150,185**		

* Preliminary totals. Grey colours: Numbers before unidentified geese have been assigned

The spring population of Bean Geese was counted during two consecutive weekends, when almost all Bean Geese of the Central Unit were concentrated in spring staging sites in south-central Sweden. On 2-3 March 61,300 Bean Geese were counted in Sweden, 425 in Denmark (Lille Vildmose and Sealand) and 100 in Finland. On 9-10 March 64,600 Bean Geese were counted in Sweden, 160 in Denmark (Lille Vildmose, Bornholm and Sealand) and 450 in Finland. During the first count, 430 Tundra Bean Geese were counted and during the second count 1,100 Tundra Bean Geese. However, considering that the single most important site, Lake Östen (9,500 Bean Geese counted 2-3 March and 13,375 counted 9-10 March), as well as Lake Tåkern (2,630 counted 2-3 March and 1,440 counted 9-10 March), both were counted during the morning flight and thus unidentified to sub-species, we would assume the number of Tundra Bean Geese was underestimated. Given that a total of 1,145 to 3,745 Tundra Bean Geese were reported in spring time at the sites Östen, Tåkern and Kvismaren in 2010-2012 (Heinicke and de Jong, 2013), that a maximum of 3,000 Tundra Bean Geese may pass northern Swedish spring staging sites (Heinicke, 2010) and that approximately 4,000 Tundra Bean Geese have been reported to winter in north-east Scania in the last couple of years (see discussion in Skyllberg, 2015), we consider it reasonable to subtract 4,000 Tundra Bean Geese from our total Bean Goose counts to yield an estimate of the number of Taiga Bean Geese.

The weather conditions for monitoring the population were almost perfect in the chosen spring period. All geese quickly left their wintering grounds in the last half of February, followed by a cold period that kept them quite steady in south-central Sweden, with very little movement to Finland. The additional numbers from the neighbouring countries to Sweden were obtained from casual records/online websites.

[4] 7488 unidentified Bean Geese were assigned to sub-species by using the same ratio as the sub-species identified geese
[5] In the traditional staging areas for Taiga Bean Geese in north-eastern Jutland all unidentified Bean Geese were assigned as Taiga Bean Geese
[6] In SE Denmark and adjacent areas unidentified Bean Geese were assigned to sub-species proportionally
[7] All unidentified Bean Geese have been assigned as Tundra Bean Geese

Based on our two spring counts, there was an average of c. 63,400 Bean Goose in the central MU. Subtraction of an estimated 4,000 Tundra Bean Geese yields an average of 59,400 Taiga Bean Geese. Because there was some rearrangement of the geese from southern to northern sites between the two dates, the relatively small difference in the two consecutive counts is very encouraging. Also, the stable numbers between years and long-term trends suggest that these spring counts provide sound population estimates.

The total number of 63,400 Bean Geese in the Central Unit (of which 4,000 are estimated to be Tundra Bean Geese) is similar to 2017 (65,500) and it seems the number of Bean Geese has now increased towards this level since 2015 (60,100). In 2011-2012 the number was as low as 47,000, decreasing from 55-57,000 in 2007-2008 (Skyllberg, 2015).

Table 4. Results of international counts of Bean Geese in the Central MU in spring 2019

Country	**Area**	**Period**	**Number of Bean Geese**			**Reported by**
			Taiga	**Estimated Tundra**	**Unidentified**	
Sweden	South and Central Sweden	2-3 March			61,300	Ulf Skyllberg
		9-10 March			64,600	
		2-3 March	57,300	4,000[8]		
		9-10 March	60,600	4,000[9]		
Denmark*			425			Thorkild Brandt & Ulf Skyllberg
		9-10 March	160			
Finland		2-3 March 9-10 March	100 450			Ulf Skyllberg
TOTAL		2-3 March 9-10 March Mean	57,825 61,066 59,446			

3.2 Harvest

Taiga Bean Geese from the Central MU were hunted in Russia, Finland, Sweden, Denmark and Germany in 2018/2019.

3.2.1 Sweden

The open hunting season for Bean Geese in Sweden extends from 1 October until 31 December, but only in the counties of Skåne and Blekinge. In addition, under derogations ('skyddsjakt') allowed under two different legal instruments and reporting systems (Jensen et al., 2017), Bean Geese can be shot to prevent damage to crops outside the normal open season and permitted areas. Derogation shooting on Bean Goose is to prevent damage on agricultural crops, however only c. 2% of the total compensation for damage on crops is related to Bean Geese (Frank et al. 2019).

The Bean Goose harvest is reported on a voluntary basis to the Swedish Association for Hunting and Wildlife Management. Such data originate from defined geographical areas and so are used to extrapolate the levels of reported harvest to unreported areas to generate estimates for entire counties and scaled up nationally.

[8] Larger groups of Tundra Beans are known to use only a few sites in spring. The number of 4,000 Tundra Bean Geese is the best estimate. These birds are known to spend the winter in NE Scania and breed in the area where N Norway, Finland and Russia meets.* In Denmark only birds belonging to CU were included in counts. Tus, NW Jutland was not included.

Proportion of Tundra and Taiga Bean Geese in Swedish harvest 2018/2019

During winter 2017/18 a targeted sampling of 233 heads from shot Bean Geese in Skåne was collected and examined for determination of the ratio between Taiga Bean Goose and Tundra Bean Goose. The project was funded by Swedish Environmental Agency and Swedish Association for Hunting and Wildlife Management (Liljebäck & Ohlsson, 2018; Jensen et al. 2018). Unfortunately, there was no funding for 2018/2019 and therefore no results available for this in 2018/2019, yet.

There is no information on the 2018/2019 derogation shooting in Sweden yet. However, of the 233 collected birds in the previous season, 44% were shot during regular hunting, i.e. open season, and 56% were shot during the period 1 January to 15 March when derogation shooting to prevent damage on agriculture crops is allowed without specific licence from authorities. When hunters were asked, they confirmed that the birds shot during derogation shooting is reported to the Swedish Game Survey, i.e. they make no distinction between birds shot during regular hunting and derogation shooting when reporting the yearly bag (See Jensen et al 2018).

When Swedish harvest data for Bean Geese in earlier years was revisited, it became clear that the total harvest had included a significant (but unknown) proportion of individuals shot during derogation shooting (Bergqvist pers.comm.). Swedish hunters were therefore encouraged to report all individuals shot during protective hunting (of all species) to the system for bag statistics in Sweden (Bergqvist pers.comm.), starting with reporting in the hunting season 2018/2019 (See Jensen et al 2018).

The age of harvested birds can be determined based on coloration of inside of the upper mandible. Ageing based on the use of aging characteristics from collected wings from harvested birds was used in some older studies (See Jensen et al 2018). However, such data were not accessible in 2018/2019.

Total harvest in Sweden

During the 2017/2018 hunting season, the total hunting bag of Bean Geese was estimated at 1,977 birds (https://rapport.viltdata.se/statistik/, accessed 1. May 2019; Table 5). Harvest data for 2018/2019 were not available at the time of writing this report. The numbers of Bean Geese shot under special licences issued by statutory authorities to reduce agricultural damage are not currently gathered and collated, but the numbers are considered to be small compared to those shot under recreational hunting.

3.2.2 Denmark

There is no national hunting season in Denmark for Bean Geese but in certain areas they can be hunted legally from 1 September until 30 November. Hunting has, since 2014, only been allowed in south-east Denmark in the municipalities of Vordingborg, Guldborgsund and Lolland. The spatial restrictions on hunting were initially established to protect Taiga Bean Geese of the Western MU in North Jutland, but later expanded to most of the country to protect Taiga Bean Geese in general.

Harvest of Bean Geese is reported by hunters through the mandatory Hunting Bag Statistics (administrated by the National Environmental Agency). Furthermore, hunters may, on a voluntary basis, submit wings from shot geese to the Danish Wing Survey. These wing samples contribute to the knowledge of the temporal hunting bag variations, as well as knowledge of age ratio.

In the 2018/2019 hunting season the total hunting bag of Bean Geese consisted of 654 birds (Preliminary data but only small changes expected; Table 5), but the number of received wings was very low. Only 2 of the 32 received wings were from juvenile birds. The wing survey data show that the juvenile percentage during the last 10 years have been below the 1986/87-2018/19 mean juvenile/adult ratio of c. 0.25 (Christensen 2019).

Based on the mandatory Hunting Bag Statistics, it has become clear that more than half of the reported Bean Geese are shot in protected areas (Sørensen and Madsen, 2017). It is unclear to what degree this results from incorrect determination of shot geese to species, limited hunter knowledge of the species or of the hunting regulations related to this species. Whatever the explanation, to mitigate any unintentional illegal hunting, the Danish Hunting Association and the Danish Wing Survey have, during 2017/2018, increased the awareness of "Grey Geese" and encouraged hunters to submit the head and tail of shot Bean Geese, or photos of these

(Sørensen and Madsen, 2017). These body parts make it is possible to distinguish Taiga from Tundra Bean Geese, and thereby obtain better information relating to the distribution of the hunting harvest of the two sub-species. In 2018/2019 73.5% of the 654 shot birds were from the legal area, differing from the previous years.

Unfortunately, only 9 heads and no photos were received during the 2018/2019 hunting season, which however may be attributed to the, compared to previous years, low number of observed and harvested Bean Geese in Denmark.

3.2.3 The Netherlands

Bean Geese are protected in the Netherlands but may be subject to scaring and shooting at local level, with permission from the local statutory authority. Focusing on the only area where Taiga Bean Geese occur, no licenses were issued in the reporting period (Table 5).

3.2.4 Finland

In Finland the Bean Goose hunting reopened 2017 in a 'Tundra Bean Goose' zone in south-east Finland after a 3-year total moratorium. Hunting was restricted to October-November and there was a mandatory requirement to report the harvest bag. Only recreation hunting is allowed, there is no derogation shooting.

The Finnish Wildlife Agency received reports indicating a harvest of 49 Bean Geese in 2018, compared to 176 Bean Geese in 2017. To gain information about the distribution of the harvest of the two sub-species, the hunters were asked to voluntarily e-mail pictures of their bird and identify them as either Taiga or Tundra Bean Geese. In addition, hunters were asked to collect head samples during 2018 for visual and DNA-analysis. The results of DNA-analysis are expected by end of 2019. Based on the collected heads of 16 Bean Geese, it was estimated by the Finnish Wildlife Agency that 11 (69%) of the birds shot were Tundra Bean Geese. This translates to a total of 15 Taiga Bean Geese that were shot out of a total of 49 Bean Geese (Table 5). This a relatively high ratio of Taiga Bean Goose to Tundra Bean Goose but this is due to low absolute numbers shot, - in fact only 1,9 % of the Finnish Taiga Bean Goose quota was used. The low number is probably a result of that in years, like 2018/2019, the major migration of Tundra Bean Gees is in the east of Finland and only low numbers are staging in Finland resulting in a high ratio of Taiga Bean Goose among the harvested Bean Geese.

3.2.5 Russia

In Russia the "official" hunting bag statistics of geese consist of mandatory hunting bag reports, but we have not received any data from Russia for this report. During the hunting season 2014-2016 a method to differentiate the species of shot waterbirds by pictures was tested. Based on the mandatory hunting bag reports an estimated 223,000 geese where shot annually between 2014-2016. Additionally, and according to the picture survey ~62,000 (27.8%) of these where Bean Geese (Solokha & Gorokhovsky, 2017; see also Jensen et al. 2018). Since the available data from Russia does not allow for a sub-species determination of Bean Geese, the data are not included in Table 5.

Table 5. Bean Goose hunting bag during the hunting seasons 2014/15-2018/2019

Country	**2014/15**	**2015/16**	**2016/17**	**2017/18**	**2018/19**
Sweden (Bean)	1,675	1,582	2,212	>1977**	NA
Sweden (Taiga)			NA	NA	NA
Denmark (Bean)	1,296	1,440	1,301	822	654**
Netherlands	0	0	0	0	0
Finland (Taiga)	0	0	0	24	15
Latvia (Taiga)***	17	20	10	0	NA
Latvia (Tundra)	1,196	1,403	685	1,238	NA
Russia*	NA	NA	NA	NA	NA
TOTAL (Bean)	**>4,184**	**>4,445**	**>4,208**	**>4,037**	**>669**

* The region of Karelia, Murmansk and Arkhangelsk

** Preliminary data

*** Numbers for the whole country, i.e. both the Central MU and the Eastern1 MU (Kampe-Persson & Boiko in MS).

3.3 Conclusion for the Central MU

A total of 41,927 Taiga Bean Geese were counted in January 2019 compared to 38,717 Taiga Bean Geese in January 2018, and 56,792 Taiga Bean Geese in January 2017. None of these estimates includes counts from Germany. Nevertheless, given the population estimates from the last few years, the Central MU appears to have either declined significantly during the last years or the counts are incomplete. For two major reasons, the latter seems most realistic:

1) It has not been possible to obtain population estimates from Germany, hence we know that the January count is biased towards the low side.

2) Counts during autumn and spring have been consistently higher than the January count. In October 2018, during the age ratio sampling in southern Sweden, the Bean Goose staging sites were checked, and a total of c. 58,900 Taiga Bean Geese were counted together with c. 3,000 Tundra Bean Geese and c. 6,300 unidentified Bean Geese. The majority of the unidentified Geese were assessed as the Taiga Bean Goose, equating to a total of c. 67,800 Taiga Bean Geese in southern Sweden, October 2018. The Taiga Bean Geese were also counted at the Swedish spring staging areas in 2019, where a total of c. 59,400 Taiga Bean Geese was counted twice during two consecutive weekends (2-3 and 9-10 March; Skyllberg, not published 2019).

The hunting bag data from the Central MU Range States shows that at least 2,799 Bean Geese were shot in 2017/2018, whereas the data from 2018/2019 is still unavailable from the main contributors. The application of the AHM programme for the Central MU of the Taiga Bean Goose requires the availability of robust estimates of population size and harvest bag data separated into the two sub-species (Taiga and Tundra Bean Geese). These two variables are the prerequisite for assessing the population response to management actions.

In 2018/2019 it has been possible to obtain reasonable count data from Denmark, Sweden and the Netherlands, but unfortunately not from Germany. In addition, while it has been possible to obtain sub-species-specific harvest data from Finland for the most recent hunting season, it has not been possible to separate the harvested Bean Geese into the two sub-species in Denmark. On the other hand, in Sweden, a large effort has now been put into separating the sub-species during the hunting season 2018/2019; hunting bag data from 2018/2019 are

however not available yet. Finally, hunting data from other Range States continues to be lacking (e.g. from Russia and Germany).

For these reasons, the successful implementation of an AHM framework for the Central Taiga Bean Goose MU cannot occur until the following data have been made available:

1) Reliable annual population estimates; and
2) Up to date sub-species-specific hunting bag data from all Range States (particularly Sweden, Finland, Denmark, Russia (by region) and Germany).

Initiatives to resolve the latter issue is already in progress in Sweden, Denmark and Finland, as described above. To our knowledge, however, no initiatives have been taken in Germany or Russia.

In Jensen et al. 2018, it was recommended to investigate an alternative to the January counts, including using the existing Swedish data series from autumn/spring for obtaining reliable population consensus estimates. These populations were monitored, and the data are described in the present report.

4 Eastern1 MU

4.1 Population Estimates

The Eastern1 MU Taiga Bean Geese winters in north-east Germany, north-west Poland, in lower numbers in southern Sweden and only in small numbers in the Netherlands. In this report, all birds in Sweden and the Netherlands were identified as Central MU birds in the absence of better information. Until better information is made available, we are forced to consider that this wintering element has contracted its wintering range eastwards into eastern Germany and Poland. However, as there have been no goose counts reported from Germany and Poland in January 2019, it is not possible to estimate the population size for the Eastern1 MU.

Some Taiga Bean Geese were ringed and equipped with loggers in the 2018 autumn in eastern Germany, near the Polish border. The results are expected to provide useful information about staging areas in the future.

4.2 Harvest

Taiga Bean Geese from the Eastern1 MU were hunted in Germany, Belarus, Russia and Poland in 2018/2019. The bag size is unknown. A new project to count Taiga Bean Geese was initiated in Olonets to obtain some results about the number and harvest in Karelia.

In Russia, the Taiga Bean Goose is included in the Red Book of many districts of the Russian Federation, including KhMAO-Ugra and the Krasnoyarsky Kray. By the end of 2018, following a five-year research project on Taiga Bean Goose, it was included in the Red data book of the region of Yamal-Nenets Autonomous Okrug (YaNAO), where a significant part of the Taiga Bean Goose population nests. This means that this sub-species is now protected from hunting within the whole territory of YaNAO (S. Rozenfeld, pers.comm.).

Spring hunting of Taiga Bean Goose is still reported from Belarus from mid-March to mid-May. For this reason, on 1 May data on the harvested number of Taiga Bean Goose from Belarus will be incomplete.

5 Eastern2 MU

The Eastern2 MU winters in south-east Kazakhstan, eastern Kyrgyzstan and north-west China, it has however not been possible to get population estimates nor harvest data from these countries.

To enhance protection measures at the regional level, Russian researchers tagged Taiga Bean Geese in the eastern part of YaNAO in the spring of 2018 and proved that they wintered in NW China (Rozenfeld et al. 2018).

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References

Brandt, T., Lund, T., Sørensen, D., Sørensen, F., Skyllberg, U., Therkildsen, O.R., Fox, A.D. 2017. Recent status and changes in abundance of Taiga Bean Geese wintering in NE Jutland. Dansk Orn. Foren. Tidsskr. 111: 138-146.

Christensen, T.K. 2019. SÆDGÅS (Anser fabalis). Vingeundersøgelsen 2018/19. http://fauna.au.dk/fileadmin/bioscience/Videnudveksling/Vingeundersoegelsen/Data_2018/Saedgaas2018.pdf.

Frank, J., Månsson, J., Höglund, L. 2019. Viltskadestatistik 2018. Skador av fredat vilt på tamdjur, hundar och gröda. Rapport från SLU, Viltskadecenter 2019-1. Viltskadecenter, Institutionen för ekologi, Sveriges Lantbruksuniversitet. ISBN: 978-91-984194-7-4.

Jensen, G.H., Fox, A.D., Christensen, T.K., Clausen, P., Koffijberg, K., Liljebäck, N., Madsen, J., Mitchell, C., Nilsson, L. 2017. Taiga Bean Goose population status report 2015/16 and 2016/17. Prepared by the AEWA European Goose Management Platform Data Centre.

Heinicke, T. 2010. Tundra bean goose *Anser fabalis rossicus* during spring migration in northern Sweden – rare visitor or regular passage migrant? Ornis Svecica 20: 174–183.

Heinicke, T. & de Jong, A. 2013. Tundra Bean Geese *Anser fabalis rossicu*s in central and southern Sweden autumn 2009–spring 2012. Ornis Norwegica 36: 32–37.

Kampe-Persson, H. 2017. Höstinventering. Vår Fågelvärld 6: 38-40.

Kampe-Persson, H. 2018. Inventering av rastande taigasädgäss, tundrasädgäss och spetsbergsgäss i Sverige hösten 2018. Unpublished report.

Kampe-Persson, H. & Boiko, D. (in MS). The Taiga Bean Goose *Anser fabalis fabalis* in Latvia: occurrence, origin and hunting.

Liljebäck, N & Ohlsson, T. 2018. Analyse of Bean Goose Harvest in County of Skåne winter 2017/2018. Manuscript of technical report to Swedish Environmental Agency.

Marjakangas, A., Alhainen, M., Fox, A.D., Heinicke, T., Madsen, J., Nilsson, L., Rozenfeld, S. 2015. International Single Species Action Plan for the Conservation of the Taiga Bean Goose (Anser fabalis fabalis). AEWA Technical Series No. 56. Bonn, Germany.

Mitchell, C., Griffin, L., Maciver, A., Minshull, B., Makan, N. 2016. Use of GPS tags to describe the home ranges, migration routes, stop-over locations and breeding area of Taiga Bean Geese *Anser fabalis fabalis* wintering in central Scotland. Bird Study 63: 437–446. doi:10.1080/00063657.2016.1236779.

Nilsson, L. 2019. Staging and wintering Taiga Bean Geese Anser fabalis fabalis in south Sweden 2016/17 - 2018/19. Report 10 pages.

Rozenfeld S.B, Zamyatin D.O, Vangeluwe D, Kirtaev G.V, Rogova N.V, Cao L, and Popovkina A.B. 2018. The Taiga Bean Goose (*Anser Fabalis Fabalis*) in Yamalo-Nenets autonomous okrug. Casarca 20:28-52.

Skyllberg, U. 2015. Numbers of Taiga bean Geese *Anser.f.fabalis* utilizing the western and central flyways through Sweden during springtime 2007-2015. Ornis Svecica 25, 153-165.

Skyllberg, U., Nousiainen, I. 2017. Tajgasädgäsen ökar efter år av minskning. Vär Fägelvärld 6: 32-37.

Solokha, A., Gorokhovsky, K. 2017. Vesilintujen metsästyssaalis Venäjällä. Suomen Riista 63: 43–52.

Sørensen, I.H., Madsen, J. 2017. Bliv klogere på de grå gæs: Fokus på sædgåsen. Jæger 9: 30-31.

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