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 WEST & CENTRAL SIBERIA/TURKMENISTAN TO W CHINA' POPULATION OF TAIGA BEAN GOOSE – "EASTERN 2 POPULATION"[1] , FORMER EASTERN 2 MANAGEMENT UNIT[2]

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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 West & Central Siberia/Turkmenistan to W China population of Taiga Bean Goose – "Eastern 2 population".

[1] Given stakeholders' familiarity with referring to the 'Eastern 2 MU', the term 'Eastern 2 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 'West & Central Siberia/Turkmenistan to W China' population of *Anser fabalis johanseni*. However, a proposal will be made to AEWA MOP9 to simplify these population names to the following: 'Central Asia (nbr)' 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.

[2] Funding for the action-planning process was provided by the Danish Agency for Green Transition and Aquatic Environment under the Ministry of Green Transition and the Finnish Wildlife Agency.

1. DRAFT BIOLOGICAL ASSESSMENT[3]

The Taiga Bean Goose and particularly its Eastern populations remain understudied. Very little information about this species and its Eastern populations exists in English language literature (Emelyanov et al, 2022). Comparatively more literature on the Eastern populations is available in Russian language, a factor which has apparently presented a barrier to its integration into English language assessments. Efforts made towards scanning Russian language literature will be beneficial in increasing knowledge about the species and its populations and can be done relatively easily using accessible online resources and tools.

1.1 Distribution throughout the annual cycle

Knowledge about the flyway of the Eastern 2 population is limited. For instance, the boundaries of the breeding range are not known, but it is thought to extend to the Yenisei River valley in the east and to 60º latitude in the south (Mooij & Zöckler 1999, Heinicke 2009). Additional monitoring efforts are needed to establish a real-world evidence base for these hypothesised boundaries, and to establish if this population range extends continuously or is fragmented into islands across its range (Rozenfeld et al, 2018). Further research is also needed to investigate if distinct boundaries between the nesting range of the populations do in fact exist (Rozenfeld et al, 2018).

Individuals in the Eastern 2 population breed in Russia and winter in Kazakhstan, Kyrgyzstan, and China. Previously, taiga bean geese were also thought to winter in Uzbekistan, but this migration route has likely been lost. Birds tracked by Rozenfeld et al (2018) in 2016-2017 provide information about the migratory routes of this population (Figure 1).

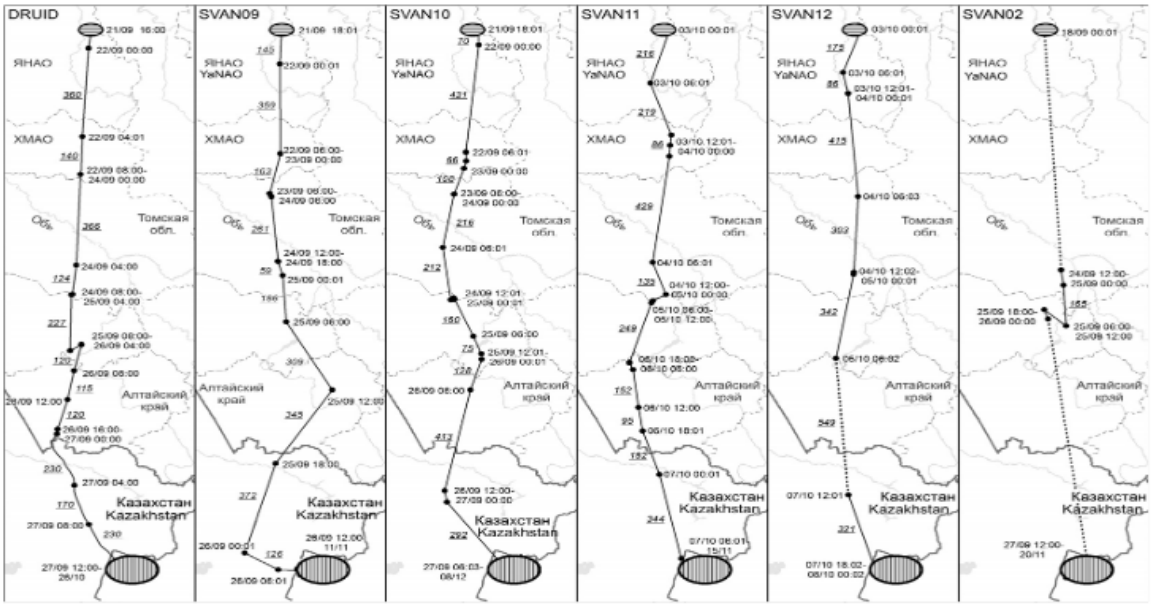

Рис. 3. Пути пролёта лесных гуменников от мест гнездования до места первой продолжительной остановки. Указаны локации сигналов передатчиков и расстояние (км) между ними (подчёркнутые цифры). Пунктирной линией обозначены участки, на которых сигнал передатчика отсутствовал.

Fig. 3. Migration routes of marked Taiga bean geese from nesting sites (actual lozenge with horizontal lines) to their first staging area (actual lozenge with vertical lines). Transmitter locations and distances between them (km; underlined figures) are indicated. Dotted lines connect locations with no transmitter signals between them.

Figure 1. Migration routes of six tagged taiga bean geese of the Eastern 2 population from nesting sites in Russia to Kazakhstan and China. Source: Rozenfeld et al (2018).

[3] Acknowledgements: Thanks to Jeremie Berlioux, who conducted the analysis of the observations on citizen science platforms, and who drafted the initial text of that section.

Breeding

Taiga bean geese are reported to nest in Russia in the forest zone of the European part, and in Western and Central Siberia, broadly representing the nesting areas of the Central, Eastern 1 and Eastern 2 populations respectively (Rozenfeld et al, 2018). There may be overlap in nesting areas among the Eastern 1 and Eastern 2 populations in Western Siberia, and among the Eastern 2 and East Asian populations in Central Siberia. Six individuals tagged in wintering grounds in the Netherlands were observed in wintering sites in Central Asia over the 1960s-80s (Marjakangas et al., 2015). More recently, one tracked bird wintering in Germany was recorded to migrate to the Yugansky Nature Reserve in Russia, in the vicinity from which birds have been recorded to migrate to Central Asia (Rozenfeld & Strelnikov, 2019). Subsequent tracking of birds over 2019-2023 in wintering grounds in Germany (Rozenfeld et al, 2024) have shown these birds migrated to breeding areas adjacent to those from which birds also migrate to Central Asia.

In Western Siberia, the Taiga Bean Goose is known to breed in Khanty-Masi Autonomous Okrug in the Elizarovsky and Yugansky Nature Reserves, the Sibirskiye Uvaly National park, and in valleys of the Bolshoi, Maly Ygan and Negus'Yakh rivers (Rozenfeld et al, 2018). In Yamalo-Nenets Autonomous Okrug, the species breeds in the Lower Ob region and along small tributaries of the Voikara, Synaya and Tanya rivers in the southern Yamal as well as in the lower reaches of the Ob river, in the interfluve of the Ob and Pur rivers, and in the Pyakolsky Nature Reserve, and Verkhne-Tazavosky Nature Resource and adjacent (Rozenfeld et al, 2018). Birds are also known to breed along the Paysyatta, Tanlova, Eva-Yakha, Severnaya and Yuzhnaya Tydeotta rivers in the Pur and Nadym river basins (Kupriyanov & Kupriyanova, 1997). Surveys undertaken over 2013-2017 by Rozenfeld et al (2018) confirmed nesting locations of the Taiga Bean Goose in the Parusovaya, Unda, Tsypolka, Khetylka, Kashky, Poluy, Sobtyyugan, Pitlyar rivers in Yamalo-Nenets Autonomous Okrug (Rozenfeld et al, 2018).

Small groups of taiga bean geese have been observed breeding in the Katon-Karagai National Park in the most eastern point of Kazakhstan (Vorobyev, 2020), which the authors identified as belong to the middendorffii subspecies, however, this observation would place those individuals at the extreme west of the assessed range (see Zhao et al, 2020). This observation is also surprising due to the comparatively southern location of the nesting site.

Taiga bean geese arrive in their breeding grounds in the north of Western Siberia starting from the last ten days of April through to early May (Rozenfeld et al, 2018). Observations specifically from the Lower Ob region during the 1980s and 1990s recorded Bean Geese arriving at their nesting sites between the end of April and early May just as the first thawed patches began to appear (Golovatin & Pazkhalniy, 2004).

Information from various sources (observations, specimens) from the 1960 through 1990s in the Lower Ob region suggested taiga bean geese were mating in May, and starting egg incubating from late May (Golovatin & Pazkhalniy, 2004). From data from the 1970s from the Yamal region, egg laying was recorded to take place over June 10-14 in the upper reaches of the Yadayakhoda-Yakha River and over June 18-19 on the Nurma-Yakha River, with chicks hatching around June 29 and July 10 respectively (Golovatin & Pazkhalniy, 2004). More recent observation from 2001 from the Erkata-Yakha River recorded hatching over July 10-12 (Golovatin & Pazkhalniy, 2004). These observations indicate short, concentrated periods of arrival and reproduction in the various breeding areas of the Taiga Bean Goose in Western Siberia(Golovatin & Pazkhalniy, 2004).

Moulting and moult migration

Moulting takes place in the tundra zones of northern Russia and the species has been observed in moult on Kanin peninsular, on the Gydan Peninsular, and Novaya Zemlya (Rozenfeld et al, 2018), likely representing moult migration locations for the Central and Eastern 1 populations. There is little information about the location for moult migrations

specifically for the Eastern 2 population although it is likely that this population, along with the Eastern 1 population, also uses the western part of Taimyr Peninsula and the Tazvosky Peninsula (Panov et al, 2020). In Yamalo-Nenets Autonomous Okrug, the floodplains of the tributaries of the Taz River are known to be breeding and moulting sites (Rozenfeld et al, 2018).

In areas of Western Siberia, birds in moult are known to form small groups of generally around 4-15 birds, with maximum flock sizes of 25 birds (Golovatin & Pazkhalniy, 2004; Rozenfeld et al, 2018).

Wintering

Taiga bean geese from the Eastern 2 population winter in southeast Kazakhstan, eastern Kyrgyzstan, and northwest China (Heinicke, 2009), and partially in India (Emelyanov et al., 2020). Soviet-era records indicate that the species was wintering in south-west of Lake Issyk Kul, and in mild winters, as far north as the middle reaches of the Ili River in Kazakhstan, and in agricultural areas at the foot of the Trans-Ili Alatau (Zailiyskiy Alatau), in southern Kazakhstan, sometimes in large numbers (Korelov, 2022). Observation records from Kyrgyzstan from the 1990s to 2020 show the congregation of flocks of taiga bean geese on the shores of Lake Issyk-Kul occurring in November and December and disbanding in February and March (Turusbek Kyzy & Taalaibekov (Taalai Uulu), 2020).

The most significant recent contribution to knowledge about the migration routes and wintering of birds of the Eastern 2 population has been made by Rozenfeld et al (2018). The authors tracked several six individuals from their nesting grounds in Yamalo-Nenets Autonomous Okrug to the wintering grounds in China near the border with Kazakhstan over 2017-2018 (Figure 2).

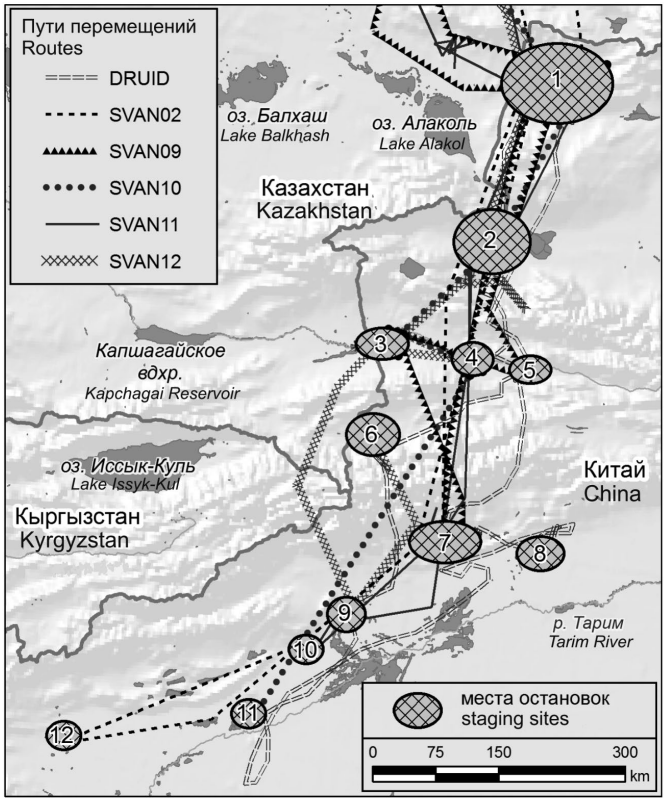

Fig. 4. The pattern of movements and stops of forest bean geese in the wintering area ki (09/26/2017 - 03/21/2018).
Fig. 4. Local movements of satellite-tagged Taiga Bean geese within the wintering ground in westernmost China (09/26/2017 - 03/21/2018).

Figure 2. Movements of six tracked taiga bean geese of the Eastern 2 population during the wintering period. Source: Rozenfeld et al, 2018.

Given the limited availability of recent scientific literature on the wintering locations of this population, expert review of recent observations from citizen science platforms may also be useful in identifying important wintering grounds for taiga bean geese of the Easter 2 population. Analysis of entries of taiga bean geese on several citizen science platforms (Ebird, iNaturalist and the series of websites 'Birds of Kazakhstan', 'Birds of Kyrgyzstan' and 'Birds of Xinjiang') highlighted the following as potentially important wintering sites:

China:

- Tacheng Prefecture, Emin County, Xinjiang Ughur Autonomous Region: A predominately agricultural landscape with important grasslands and wetlands. Groups observed range from single birds to a flock of 345 birds (October 2019).
- Urumqi region, Xinjiang: A predominately agricultural landscape with large water reservoirs. Groups observed range from a few individuals to 500 birds (October 2023). Observers noted that the large flocks were migrating.
- Aksu, Kashgar, and Hotan Counties (western tip of Xinjiang): The landscape is agricultural with regular irrigation reservoirs and wetlands. Groups ranged from single individuals to 400 birds in Kashgar county (February 2023).

Kazakhstan:

- Sorbulak Lake system: A steppe and agricultural landscape. This is a well-monitored site with flocks ranging from a few individuals to several hundred (counts very conservative and based on the photos made available by observers on birds.kz) observed regularly over September to November and several observations in February and March. Observations made over 2012-2024.
- Southern shore of Kapshagai Reservoir: Agricultural landscape and wetlands. Taiga bean geese appear to be regular visitors here, with flock sizes around several dozen individuals observed between October and December. Observations made over 2016-2020.
- Valley of Katon-Karagai: A forest and agricultural landscape. Regular observations in April of small groups, up to 30 individuals. Observations made over 2018-2023.

Kyrgyzstan:

- Eastern Issyk-Kul Lake IBA: An agricultural landscape with wetlands. Groups were observed in autumn with migrating flocks of up to 450 individuals (October 2023). Small groups observed wintering.

Migration

Little is known about the migration patterns and key stopover sites for this population. Birds tracked by Rozenfeld et al (2018) all crossed the Boro-Khoro Ridge then Tian Shan mountains on their southward autumn migration, flying at altitudes of up 4370m. One bird that was tracked on its return northward migration during spring crossed the Tian Shan in different locations but the Boro-Khoro Ridge in approximately the same location (Rozenfeld et al, 2018).

Recent records of increasing observations of the species in the Southern Altai in Kazakhstan during spring and autumn migration periods over 2015-2020 may indicate the restoration of the Bukhtarma migration route, which passes between the villages of Katon-Karagai, Chingistai and Uryl, in the very east of Kazakhstan (Berezovikov & Pekuts, 2022). Increased observations were reported not only for the Taiga Bean Goose but for other geese species (Berezovikov & Pekuts, 2022), likely indicating dynamic changes in other locations along a common flyway.

In Kazakhstan, the presence of taiga bean geese in spring migration in the Upper Irtysh basin has previously been recorded from early to late April (Rozenfeld et al, 2018) with more recent records of an individual in migration as late

as May in Semey (formerly Semipalatinsk) in eastern Kazakhstan. Locations of spring migrations stopovers in the north of Western Siberia include the mouth of the Irtysh River, Lower Dvuobye wetlands, the Taz and Pur river basins (Heinicke, 2009, Rozenfeld et al, 2018).

In Kyrgyzstan, historical records indicate that spring migration occurs from 20th of March to the 20th of May (Turusbek Kyzy & Taalaibekov (Taalai Uulu), 2020).

Findings from Rozenfeld et al (2018) suggest that birds of the Eastern 2 population make only short stopovers in Russia during the southward autumn migration (Rozenfeld et al, 2018). Birds tagged by Rozenfeld et al (2018) in the Krasnoselkupsky district of the Yamal Nemets Autonomous Okrug began their migration without prior congregation into groups, departing directly from their breeding sites in late September and early October and after 3-5 short stops, arrived at their first long stopover, the Kazakhstan-China border, within 5-6 days. Of these tracked birds, the maximum distance flown between stops was 1400km, completed in 36 hours (Rozenfeld et al, 2018).

Soviet-era records from the 1950s and 1960s of Taiga Bean Goose migration during October and November identified the Tekes River valley in Kazakhstan as a migratory transit from the Ili valley towards wintering sites in Lake Issyk-Kul in Kyrgyzstan. Taiga bean geese were recorded to characteristically stop to rest and feed in stubble fields adjacent to the Tekes and Bayankol rivers and in marshland near the Tekes and Kakpak villages (Berezovikov & Pekuts, 2022).

Several observations of wintering individuals have been exceptionally observed in the vicinity of Ust-Kamenogorst in eastern Kazakhstan, all presumed to have originated from migrating flocks (Berezovikov & Guselnikov, 2019), potentially of interest for understanding autumn migration routes.

In Kyrgyzstan, the Taiga Bean Goose passage migrants are recorded from late September, and arrival of the smaller population of wintering birds from October through November (Turusbek Kyzy & Taalaibekov (Taalai Uulu), 2020).

1.2 Habitat requirements

Nesting habitats

Nesting habitat includes raised bogs, taiga lakes and open valleys of small rivers where nests are made in open, elevated areas, at times in bushes or between grass tussocks, and occasionally under trees in the forest (Rozenfeld et al, 2018).

Based on the field observations of Rozenfeld et al (2018) from the in Yamalo-Nenets Autonomous Okrug in the Krasnoselkupsky district, the Taiga Bean Goose nests and raises broods along rivers with forb-sedge meadows dominated by *Arctophila fulva* with creeping bent grass (*Agrostis stolonifera*) and Gmelin's buttercup (*Ranunculus gmelinii).* Riverbanks are populated by mixed thickets of beaked sedge (*Carex rostrata)* and blister sedge (*Carex vesicaria)* and on occasion water sedge (*Carex aquatilis*) growing at heights of maximum one metre. Other plants present in these areas include marsh cinquefoil (*comarum palustre),* field and water horsetail (*Equisetum arvense and E. fluviatile), m*arsh marigold *(Caltha palusris),* creeping buttercup *(Ranunculus repens), m*arsh bedstraw *(Galium palustre),* and pale smartweed *(Polygonum scabrum)* (Rozenfeld et al, 2018).

Swamps constitute an important foraging habitat in the nesting areas observed in Western Siberia and can be characterised as large hummocky peat bogs with hummocks covered that are covered by berry bushes, and ridge hummock swamps with hummocks covered by grasses (Rozenfeld et al, 2018).

Migration

Birds in migration in Yamalo-Nenet Autonomous Okrug have been observed concentrating in groups in sorrel meadows (Rozenfeld et al, 2018). Birds migrating through eastern Kazakhstan in spring have been observed to stop in small salt lakes in wormwood (*Artemisia*) grass steppe (Berezovikov & Feldman, 2015). During the stopovers in Russia, birds tracked by Rozenfeld et al (2018) made brief stopovers (8-40 hours) in large marsh areas and in agricultural fields or small ponds. In Kazakhstan, birds stopped at lakes (Rozenfeld et al, 2018).

Wintering habitat

Birds tracked by Rozenfeld et al (2018) over 2017-2018 spent winter in several key habitats and locations. This included twelve sites that could be categorised into eight habitat types in China near the Kazakhstan border:

(1) Wide, marshy saline lowlands between the Emel and Koksu rivers in China near the Kazakhstan border, surrounded by agricultural fields, small reservoirs, and with large areas of natural vegetation. This lowland floods in spring, and by autumn only small pools of water remain in depressions. During this wintering period, tracked birds spent approximately half their time on the rivers or marshland ponds. Around one-quarter of their time was spent in agricultural fields, and the remainer in the floodplain or steppe. During the wintering period the birds would fly to nearby fields at distances of 1.5 to 20 km, and sometimes make longer journeys to the reservoirs (50-90 km).
(2) Agricultural landscapes in the floodplain of the Boro-Tala River.
(3) Agricultural lands along the Ili River. Tracked birds that wintered in agricultural lands along the Ili River spent a majority of their time in the river or in the floodplains, and around one-third of their time in agricultural fields, also making several forays along the floodplain of up to 70 km, and even into the surrounding mountains.
(4) Agricultural lands between the Small Muzart and Northern Muzart rivers. Here one tracked bird spent three-fifths of its time in swampy floodplain areas and the remainder in nearby agricultural fields at distances of maximum 10 km.
(5) A 7-18 km strip of farmland along the Muzart River. Some of the tracked geese wintering at this location spend their time exclusively in agricultural fields, while others spent up to four-fifth of their time in the river or on the floodplains, with the remainder spent in the agricultural fields, making short excursions of up to 10 km to the steppe and reservoirs.
(6) Agricultural lands along the banks of the Muzart and Tarim rivers with many and various different water bodies. One tracked bird spent more around two-thirds of its time on rivers and floodplains and the remainder in agricultural fields, sometimes making flights to water bodies and into the steppe, at distances of maximum 40 km.
(7) Agricultural lands around the Aksu River. Tracked birds wintering here spend around three-fifths of their time in agricultural fields and made short flights to reservoirs 9-13 km away.
(8) A large oasis on the Kashgar River. One tracked bird wintering here spent 50% of its time on the river and 50% in nearby fields at a maximum distance of 2 km. This bird also made several forays to a pond 10 km away.

Taiga bean geese records from citizen science platforms indicated the following habitat types. In China, birds were observed in grasslands and wetlands and in agricultural landscapes with water reservoirs. In Kazakhstan, birds were observed in steppe and agricultural landscapes, in agricultural and wetland landscapes, and in forest and agricultural landscapes. In Kyrgyzstan, birds were observed in agricultural landscapes with wetlands.

Based on the behaviour of the tracked birds in Rozenfeld et al (2018), it is likely that taiga bean geese sighted at Issyk Kul Lake during wintering periods are in fact only brief visitors to the lake on short forays, and may spend much more of their time in the agricultural, steppe-like and wetland areas nearby. Further monitoring is needed to confirm this.

Feeding habitats and diet

In nesting areas in Western Siberia, Taiga Bean Goose diets included 10 plant species: Wideleaf polargrass (*Arctagrostis latifolia),* field horsetail (*Equisetum arvense), Arctophilia fulva,* pale smartweed (*Polygonum scabrum),* blueberry (*Vaccinium myrtilis),* bilberry *(V. uliginosum),* beaked sedge (*Carex rostrata),* blister sedge (C. *Vesicaria),* water sedge (C. *aquatilis),* and *Ranunculus gmelini* (Rozenfeld et al., 2018). Adult diets were composed of blueberries and bilberries (50%), and wideleaf polargrass, sedges, and field horsetail, while blueberries and bilberries also comprised half of chick's diets, with the remainder dominated by field horsetail (*Equisetum arvense*) (Rozenfeld et al., 2018).

1.3 Survival and productivity

There is little information about survival and productivity of birds in the Eastern 2 population. Rozenfeld et al (2018) calculated an average brood size of 3.9 chicks among 16 broods observed in 2017 in the west of the Yamalo-Nenets Autonomous Okrug.

1.4 Population size and trend

Limited information is available about the Eastern 2 population sizes and trends due to lack of systematic monitoring and indeed the difficulties associated with physical observation of this species. With scant information on numbers from Kazakhstan, Kyrgyzstan, and China (and Uzbekistan, where the species was once known to winter) due to lack of resources available locally for monitoring and research, observations from Russia provide the most relevant data. Here, however, the species is widely and generally sparsely distributed over enormous areas during its breeding season and is not the focus of any targeted monitoring, meaning that both historical and modern records rely overwhelmingly on short-term hyper-localised snapshots or coincidental observations of one or several individuals. Currently, reports on bird numbers in Russia are generally provided by the staff of protected areas and by hunters (Rozenfeld et al, 2018). In Kazakhstan and Kyrgyzstan, park rangers and hunters would also be candidates for collection of monitoring data, although these groups would likely benefit from capacity investments to ensure correct identification.

According to the Red Book of the Russian Federation (2021), in Russia, current population estimates stand at 2,000-3,000 individuals in the Khanty-Mansi Autonomous Okrug (KMAO), less than 15,000 individuals in the Yamalo-Nenets Autonomous Okrug (YNAO), and fewer than 100 pairs in the Nenets Autonomous Okrug, fewer than 1,000 individuals in the Altai Republic, several pairs only in the Kemerovo Oblast, and a single individual in Novosibirsk Oblast. In Western Siberia estimates suggest 17-20,000 breeding individuals, most of these who are assumed to belong to the Eastern 1 population. Several thousand individuals were estimated to be breeding in the forested zone between the Nadim and Taz rivers based on a 1997 assessment. Subsequent assessments from the 2000s in the northern Taiga of Western Siberia stood at 800-3,000 breeding individuals. Another assessment estimated the population of both breeding and non-breeding birds in northern Western Siberia at 1500 individuals. Nine hundred and thirty-three individuals were recorded during autumn migration in 2014 in the western part of YNAO, while in the north of the KMAO experts estimate a population size of 10,000 individuals (both breeding and non-breeding). Since 2006, populations on the left bank of the Yenisei River have been steadily declining, dropping to fewer than 30,000 individuals in the Turukhansk district and areas adjacent to the Taimyr in Krasnoyarsk Krai. Population estimates of individuals undertaken following the breeding season over 2006-2014 stood at 10-18,000 individuals in the headwaters of the Tym River and tributaries of the Middle Keti River (Red Book of the Russian Federation, 2021).

Rozenfeld et al (2018) point out that estimating Taiga Bean Goose population size in the Yamalo-Nenets Autonomous Okrug through identification of nesting and moulting sites will provide crucial information for understanding the species' status (Rozenfeld et al, 2018), and could be considered a key step in generating a solid evidence basis for management of the Eastern 2 population. Efforts targeted at monitoring taiga bean geese number in the spring and autumn migration periods in Tamalo-Nenets Autonomous Okrug would likewise be crucial for understanding the population size, and could be undertaken during the brief migration periods when this species separates from the Tundra Bean Goose, which nest further to the north of the Okrug (Rozenfeld et al, 2018).

Records from the late 1990s indicate that several thousand birds were nesting between the Nadym and Taz rivers alone (Kupriyanov & Kupriyanova, 1997). Subsequent data of bird numbers collected in the same area during the breeding season over 1994-2009 suggested total numbers peaked at 1,500 breeding and non-breeding individuals (Golovatin, 2010).

Observations of nesting bird numbers in western Central Siberia (on the western bank of the Yenisei River) show steady declines since 2006 (Rozenfeld et al, 2018). Available information suggests that less than 30,000 nesting geese remained in the Turukhansk region and adjacent to Taimyr of Central Siberia by 2018 (Rozenfeld et al, 2018), however some birds nesting in these areas may also migrate along the Eastern Siberian/Asian flyway.

Waterfowl surveys conducted by Rozenfeld et al (2018) in the Yamalo-Nenets Autonomous Okrug (YNAO). In the Pyakolsky Nature Reserve in the Krasnoselkupsky District (in the Pyakolka River basin), six pairs of taiga bean geese were observed in spring 2013, thirty broods in summer 2014, at least 19 broods in summer 2016, and the same number in summer 2017 (Rozenfeld et al, 2018). Aerial waterfowl surveys in 6 administrative districts (Priuralsky, Shuryshkarsky, Nadymsky, Tazovsky, Purovsky, Krasnoselkupsky) counted 933 Taiga Bean Goose individuals during September 2014 (Rozenfeld et al, 2018). Subsequent aerial surveys of the YNAO observed 1400 individuals in 2020 and 2909 individuals in 2021 (Rozenfeld, 2025a).

Assessment of Taiga Bean Goose populations during different seasons in Kyrgyzstan from the 1990s to 2020 suggest the species varies from uncommon to common in winter (representing between 11-99 and 100-199 individuals respectively, according to the author's classification), and common during the spring and autumn migratory periods (Turusbek Kyzy & Taalaibekov (Taalai Uulu), 2020). Surveys conducted in Kyrgyzstan over 2018-2019 showed a downward trend in population numbers compared to earlier periods (1990s onwards) without specifying group sizes (Turusbek Kyzy & Taalaibekov (Taalai Uulu), 2020). An earlier, more precise study observed 48 taiga bean geese wintering at Lake Issyk-Kul in 2005, compared to records of almost 600 birds wintering in 1998, possibly indicating a decline in the wintering population at that location (Heinicke, 2009). Outside Lake Issyk-Kul, other areas have not been consistently monitored, providing a barrier for understanding population trends (Heinicke, 2009).

Monitoring methodologies may also benefit from a deeper understanding of wintertime movements and habitat preferences, in light of the results of tracking data from the study by Rozenfeld et al (2018). For example, as birds of this population have been shown to spend a minority of their time during winter at lakes in the border areas of China and Kazakhstan (Rozenfeld et al, 2018), surveys may need to extend to agricultural, steppe and wetland areas and not focus solely on major lakes, as has been routine for monitoring in Kyrgyzstan.

In Kazakhstan, most recent available estimates suggested only several dozen individuals wintering in the country's southeast (Erokhov, 2012).

As the breeding areas for the Eastern 2 population in Russia likely overlap with at least the Eastern 1 population, estimates for this population should be made based on wintering numbers in Central Asia. Taiga Bean Goose numbers in Russia during the spring and summer breeding and moulting season are estimated at the very maximum at around 19,000 (numbers from estimates of population sizes in the KMAO, YNAO, Nenets Autonomous Okrug, Altai Republic, Kemerovo Oblast, and Novosibirsk Oblast), with many of these individuals assumed to belong to the Eastern 1 population (Red Book of the Russian Federation, 2021). Nine hundred and thirty-three individuals were recorded in 6 administrative districts in Yamalo-Nenets Autonomous Okrug in 2014 (Rozenfeld et al, 2018), 1400 individuals in 2020, and 2909 individuals in 2021 (Rozenfeld, 2025a), birds which most likely belong to the Eastern 2 population. Records of wintering populations in Central Asia are scarce. Expert review of recent observations from citizen science platforms could indicate the presence of at least several hundred individuals in wintering grounds in China, Kazakhstan, and Kyrgyzstan. Extensive monitoring is needed to obtain robust estimates of the Eastern 2 population numbers.

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**
China	N/A	-	-	Unknown	-	Unknown. Groups of up to approximately 500 individuals recorded on citizen science platforms over 2019-2023.	Expert assessment of citizen science data.	-
Kazakhstan	N/A	-	-	N/A	-	Unknown. Groups of up to several hundred individuals recorded on citizen science platforms over 2012-2024.	Expert assessment of citizen science data.	-
Kyrgyzstan	N/A	-	-	N/A	-	Unknown, but declining trend of wintering and migrating populations. Groups of up to approximately 450 individuals	Several sources only, survey methodology and scope unclear; Expert assessment of citizen science data.	1990s - 2019

						recorded on citizen science platforms in October 2023.		
Russia	17-20,000 breeding individuals in Western Siberia, but assumed to be mostly belonging to the Eastern 1 population	From the Red Book of the Russian Federation (2021)		Declining	From the Red Book of the Russian Federation (2021)	Unknown	-	-
Overall								

2. DRAFT PROBLEM ANALYSIS

2.1 General overview

There is little information available about the threats or problems facing the Eastern 2 population specifically. As this population nests in Russia and since nesting areas of the Eastern 1 and Eastern 2 populations may overlap, threats and problems at least in Russia are very likely common across the populations. Reflecting the country-level efforts into Taiga Bean Goose research and monitoring, almost no information on threats and problems in China, Kazakhstan, or Kyrgyzstan is available in the literature. Available information suggests that both legal and illegal hunting is the main threat faced by the Eastern 2 population along its flyway.

2.2 Hunting

In Russia, the Taiga Bean Goose appears in the Red Book of the Russian Federation. In Russia's Yamalo-Nenets Autonomous Okrug, legal harvest and poaching are the main reasons for Taiga Bean Goose population decline in the region (Rozenfeld et al, 2018). Legal harvest takes place in the spring period, over late April to May, coinciding with the start of the incubation period. The timing of this spring hunting period allows destruction of the core reproductive population (Rozenfeld, 2025b) and is highly disruptive to nesting birds (Rozenfeld et al, 2018). Young, non-breeding birds are more vulnerable to poaching, particularly during the summertime, when they embark on their moult migration to areas further north and are more visible to hunters (Panov et al, 2022). Poaching of moulting birds also contributes to population decline in this region, along with the associated disturbance from motorboats (Rozenfeld et al, 2018).

There is no available information on legal harvest numbers in Kazakhstan and Kyrgyzstan. In Kazakhstan, regulations for legal harvest of geese do not differentiate between species. That is, within the current regulation, all goose species except those listed in the country's Red Book, can be legally hunted without limitations during different period by regions. Thus, the legal hunting period for geese, including the Taiga Bean Goose, are from the last Saturday of August

to November 30 (Akmola, East Kazakhstan, Kostanay, Pavlodar, and North Kazakhstan regions), from the first Saturday of September to December 15 (Aktobe, Almaty, West Kazakhstan, Zhambyl, Karaganda, and Kyzylorda regions), from September 15 to December 15 (Atyrau region) and from the second Saturday of September to December 31 (Mangistau, Turkestan regions). These hunting period coincide with the population's autumn migration and part of the wintering period in Kazakhstan. In Kyrgyzstan, the hunting season for the Taiga Bean Goose is from 13 September to 21 December (2025), without limit on numbers. In both countries there is no regular state or other monitoring of populations in the country, and thus hunting regulations are not evidence-based or in line with modern adaptive management practices. Furthermore, in both countries little resources are available for patrols to ensure that hunting regulations are properly enforced.

No information is available on illegal harvest of taiga bean geese in Kazakhstan or Kyrgyzstan.

2.3 Habitat destruction

Although little information is available about this threat in the literature, habitat destruction across the Eastern 2 population flyway is likely an increasing pressure.

In Russia's Yamalo-Nenets Autonomous Okrug, development of natural gas reserves and construction of associated facilities are occurring in breeding areas of the Taiga Bean Goose, causing a significant threat to the population (Rozenfeld et al, 2018).

In its wintering areas in China, Kazakhstan, and Kyrgyzstan, agriculture and land use changes probably constitute a main threat to the population (Heinicke, 2009).

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

Population: West & Central Siberia/Turkmenistan to W China - Eastern 2 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 5.1.1 Intentional use)	Affects the whole population (>90%)	*Specifics unknown but causing or likely to cause rapid to very rapid declines*	*Ongoing*	
Habitat loss (IUCN threat 3.1 Oil & gas drilling)	*Oil and gas infrastructure is placed in some areas of the TBG nesting grounds in the Yamalo-Nenets Autonomous Okrug (and likely also nesting areas in other oblasts, but no info on that).* *i.e., Unknown*	*Local to nesting sites in specific areas in Russia, unknown how widespread this is i.e., Unknown*	*Ongoing*	

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

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