Status of Little Bustard *Tetrax tetrax* in Russia based on assessments in four key regions

MIKHAIL LVOVICH OPARIN, OLGA SERGEYEVNA OPARINA, ANTON ALEXANDROVICH ABUSHIN, VIKTOR NIKOLAYEVICH FEDOSOV & ALEXANDER ALEXEYEVICH NEFEDOV

Summary: We review the current distribution and numbers of the Little Bustard *Tetrax tetrax* in the Russian Federation with a focus on (1) Republic of Kalmykia, (2) Saratov and Volgograd oblast's, (3) Orenburg oblast' and (4) Western Siberia. We describe the regions of Russia in which this species currently nests, habitats used in the breeding period and during post-breeding short-distance migrations, and its migration routes to and from wintering grounds. We estimate the total number of Little Bustards in Russia at 100 000–130 000 individuals, but this figure is approximate, as it is based on different methods, involving detailed and comprehensive surveys of entire territories, transects with the extrapolation of data to an entire region and expert estimates. In the breeding season and during post-breeding short-distance migrations, Little Bustards are unevenly distributed across the region. In spring, birds use agricultural land with fallow fields and uncultivated steppe with abandoned fields. In autumn, the species predominantly uses agricultural landscapes. The main threats to Russian Little Bustard populations are the intensification of agricultural production through chemical applications, the reclamation of long-abandoned fields and virgin lands to cultivate more oil-producing and winter cereal crops, collisions with overhead powerlines and illegal hunting, both in winter and, to a lesser extent, when birds form pre-migration flocks in autumn.

INTRODUCTION

The Little Bustard *Tetrax tetrax* is listed in the Red Data Book of the Russian Federation as a Rare (category 3) and Vulnerable species, assigned as national conservation priority III (Oparin & Fedosov 2021), a status that raises concern for its future without prescribing intervention measures. It usually inhabits steppes and semi-deserts, but can also be found in sandy steppes and dry meadows used for grazing livestock. It prefers nesting in flat or slightly undulating virgin lands, areas with perennial grasses and fallows at early and late successional stages; more rarely it breeds in crop rotation areas, but avoids weedy fallows. Such habitat involves somewhat sparse and relatively short vegetation mixed with small open *solonetz* (compact sodium-rich soil of usually low fertility) areas (Oparin & Fedosov 2021).

Until the 1930s, the Little Bustard's range in Russia covered the entire steppe zone from its western limit to the foothills of the Altai, even extending into the forest-steppe zone (Spangenberg 1951). Around the middle of the 20th century this continuous range began to fragment as a result of agricultural expansion and intensification and soon consisted of small isolated segments, with the species disappearing from the Central Black Earth region—Voronezh (Vengerov 2005, AYu Sokolov pers comm), Tambov (Sokolov & Lada 2012), Penza (hence omitted from Anon. 2005) and Ulyanovsk oblast's (Artem'eva *et al* 2015)—and the Republic of Tatarstan (Akseev *et al* 2016) (Figure 1). We outline the contemporary status of the Little Bustard across the Russian Federation with reference to four economic regions, described below from west to east (see Figure 1). Oblast' is Russian for province, with krai being equal in status but referring to historical border areas. Republics are also of roughly equivalent status, with special rights for the titular nationality.

First, in the North Caucasus region, the species currently breeds in Rostov oblast', Stavropol' krai, the Chechen Republic and Dagestan (Belik 2013, 2014, Malovichko & Fedosov 2006, Dzhamirzoev *et al* 2013, Fedosov & Malovichko 2018, Gizatulin 2020), with a small population surviving in the Azov region in the Taman peninsula of Krasnodar krai (Lokhman 2017). It is, however, considered extinct as a breeding species in the foothills

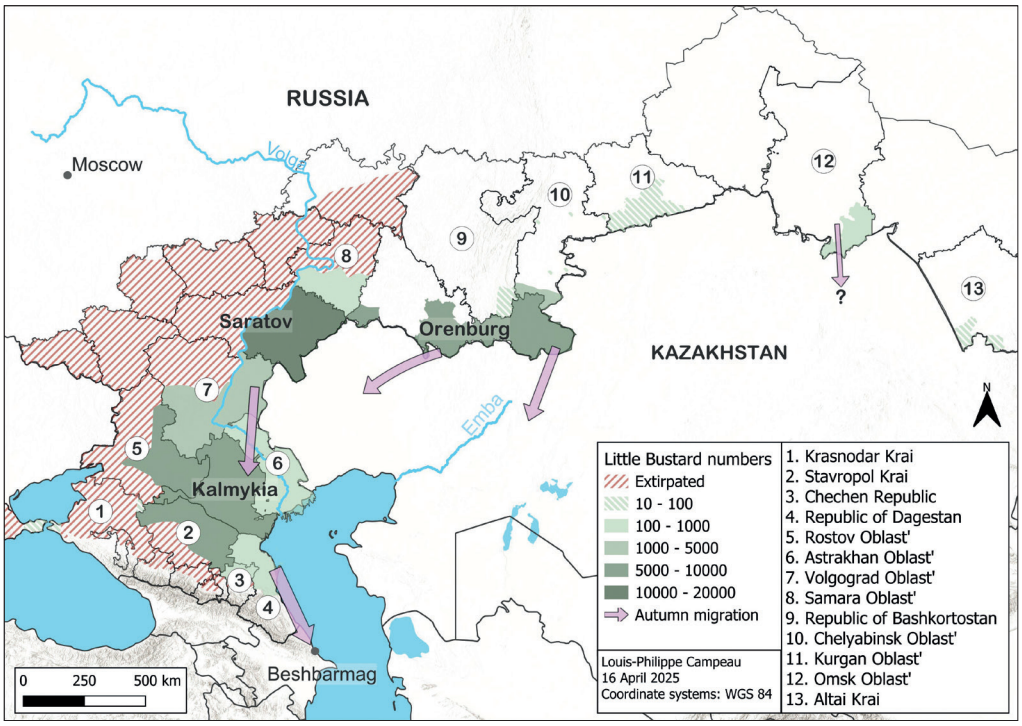

Figure 1. Map of the Little Bustard's breeding distribution in Russia.

of the Caucasus range, in the republics of Karachay-Chekessiya, Kabardino-Balkaria and Ingushetia (Dzuev 2000, Batkhiev & Tochiev 2007, Karavaev & Khubiev 2013).

Second, further north-east in the Volga region small numbers breed in the dry steppes and semi-deserts of Astrakhan' oblast' (Finogenov 2007, Reutskii 2014), with larger numbers found in Kalmykia (Muzaev *et al* 2015). Immediately to the north, along the lower Volga, the Little Bustard breeds in Volgograd and Saratov oblast's, mainly in their trans-Volga sectors (east of the river) (Chernobai & Bukreev 2017, Oparin *et al* 2017, Oparina & Oparin 2020, Oparin & Oparina 2021). This pattern recurs in the middle course of the river, with all breeding birds in Samara oblast' found in trans-Volga areas (Pavlov *et al* 2009, Kuzovenko & Lebedeva 2018).

Third, in the Ural region, the species is mostly recorded in Orenburg oblast' and across the Ural mountain range in Chelyabinsk oblast', where it inhabits steppes adjacent to Kazakhstan (Korovin 2001, 2004, 2013, Fedosov *et al* 2017, Fedosov 2019, Kornev & Gavlyuk 2019). In the 21st century, a few widely dispersed displaying males have also been recorded in the east of Bashkortostan (Gashek & Chichkova 2014).

Finally, Western Siberia forms the eastern boundary of the Little Bustard's range in Russia. Kurgan oblast', although strictly part of the Ural region, is treated here as part of this population as it shares many similarities with Siberian populations. Indeed, since the late 20th century, Little Bustard populations in Kazakhstan have begun to reoccupy steppe areas in the south of Kurgan and Omsk oblast's, as well as Altai krai (Tarasov 2011, Nefedov 2013, Kotlov 2015), and in May 2013 some vagrant birds were recorded in south-west Tyva Republic (Archimaeva & Zabelin 2015). All the populations described above are migratory.

Published population estimates

In the 1990s, Little Bustard numbers were low throughout Russia owing to socio-economic changes. Following the collapse of the Soviet Union, up to half of all agricultural fields were left unworked and there was a sharp reduction in livestock grazing. Unlike in drier steppes further south, higher rainfall promoted the growth of weedy vegetation that was too tall to be suitable as breeding habitat (Oparin *et al* 2016). However, in the early 2000s the species' population gradually began to rise, reaching a peak in 2010–2017, when the largest numbers were recorded in the European part of Russia. Currently, however, the population in that part of the country is in decline.

The account that follows is largely based on data from the Red Books of the administrative units mentioned, which were published between 2009 and 2020. In the North Caucasus, the core areas are Rostov oblast' and Stavropol' krai with 5000–6000 and 4800–5600 breeding birds respectively (Malovichko & Fedosov 2006, Belik 2014, Fedosov & Malovichko 2018). Closer to the Caucasus mountain range, 800–1000 individuals breed in Dagestan (Dzhamirzoev *et al* 2013), about 500 in Chechnya (Gizatulin 2020), and a few individuals on the Taman peninsula in Krasnodar krai (Lokhman 2017).

In the Volga region, a small number nest in Astrakhan' oblast' along the Volga–Akhtuba floodplain all the way down to the Volga delta (Lindeman *et al* 2005) and around numerous shallow seasonal lakes in the steppe along the Volga (Reutskii 2014). Around 15 000 Little Bustards used to nest in Kalmykia (Muzaev *et al* 2015), where the current breeding population is roughly estimated to be 9000 individuals. Most of these nested in the west in the dry grass steppes of the Ergeni hills, where transect surveys showed an average density of 192 individuals/100 km² in early April and 125 individuals/100 km² in early May (Muzaev *et al* 2015, Ubushaev *et al* 2016). The population breeding near the lower Volga consists of about 9000–18 000 birds in Saratov oblast' (Oparin *et al* 2017; also Table 1) and 4400–5000 in Volgograd oblast' (Chernobai & Bukreev 2017). This number was higher, up to 30 000 from the early 2000s to the late 2010s, but since that time the Little Bustard has completely disappeared from the right bank of the Volga in Saratov oblast' and adjacent areas in Volgograd oblast' (Oparin *et al* 2017, Oparina & Oparin 2020, Oparin & Oparina 2021). Only 50–150 birds inhabit Samara oblast' (Pavlov *et al* 2009), also east of the Volga river.

In the Ural region, a population of 2000–3000 birds has been estimated in Orenburg oblast' (Kornev & Gavlyuk 2019), although extrapolation of the results of a special survey conducted across a portion of the oblast' in May 2016 to the total, but not yet fully utilised, area of potential nesting habitats suggested the possibility of as many as 75 000 (Fedosov *et al* 2017, Fedosov 2019). Some 5000 birds were estimated in Chelyabinsk oblast' in the early 2010s (Korovin 2013), but in trans-Ural Bashkortostan only a few individuals have been recorded in the breeding season (Gashek & Chichkova 2014).

Finally, some 100–200 birds nest in the steppe regions of Western Siberia, divided between Kurgan and Omsk oblast's and Altai krai (Tarasov 2011, Nefedov 2013, Kotlov 2015).

The total Russian population in 2010–2017 was estimated at 100 000–130 000 breeding individuals (Oparin & Fedosov 2021); the relative importance of major administrative divisions in terms of numbers is shown in Figure 1. This number exceeds the total largely derived from published sources from each region, which is (at its uppermost limit) 61 050 breeding birds (see Table 1). While this is considerably lower than the 150 000–200 000 wintering individuals recorded in Azerbaijan (Gauger 2007), it is possible that the sources used have omitted some breeding populations in the Russian Federation, or more likely that there is a considerable influx of Little Bustards from Kazakhstan into the Caucasus flyway. Birds from Orenburg oblast', the Volga region and Volga–Don interfluve migrate through the territories of Kalmykia and Stavropol' krai, and then fly across Dagestan and

Table 1. Population estimates for the Little Bustard per administrative unit (federal subject) of the Russian Federation, arranged by economic regions. Data are presented for the breeding period, assembly for migration and wintering (Dagestan and Kalmykia only). The year that follows the name of administrative units is that of the publication of the most recent local Red Book, on which the corresponding Little Bustard numbers are based. Numbers for areas in italics are updated estimates by the authors of this article. 'Migration' covers pre-migratory gatherings and stopover flocks. Quality of estimate: 1 = low, 5 = high. Ave = average. † = extirpated.

Economic region	Season	Number of birds	Important sites	Quality of estimate	Population change trends			
					1950–1990	1990–2020	2020–2023	1950–2023
North Caucasus	**Breeding (total)**	**11 106–13 110**	4	Ave 3.8	↘	↗	↘	↗
	Krasnodar Krai 2017	6–10	1	3	↘	↘	N/A	↘
	Rostov oblast' 2014	5000–6000		3	↘	↗	N/A	↗
	Stavropol' krai 2018	4800–5600		4	↘	↗	N/A	↗
	Republic of Dagestan 2013	800–1000		4	↘	↗	N/A	↗
	Republic of Chechnya 2020	500		4	↘	↗	N/A	↗
	Migration	*c*100 000	Dagestan	5	↘	↗	↘	↘
	Wintering	300	Dagestan	5	N/A	N/A	N/A	N/A
Volga region	**Breeding (total)**	**22 750–32 650**	5	Ave 3.6	↘	↗	↘	↘
	Saratov oblast' 2017	9000–18 000	1	4	↘	↗	↘	↘
	Republic of Kalmykia 2013	9000	1	4	↘	↗	↘	↘
	Volgograd oblast' 2017	4400–5000	1	3	↘	↗	↘	↘
	Astrakhan' oblast' 2013	300–500	2	4	↘	↗	↘	↘
	Samara oblast' 2009	50–150	1	3	↘	↘	↘	↘
	Migration	100 000	3	5	↘	↗	↘	↘
	Wintering	100–200						

Ural	**Breeding (total)**	**15 010–15 020**	3	Ave 3.3	↘	↗	↘	↘
	Orenburg oblast' 2019	10 000	1	2	↘	↗	N/A	↘
	Chelyabinsk oblast' 2013	5000	1	4	↘	↗	N/A	↘
	Republic of Bashkortostan 2014	10–20	1	3	Absent	↗	N/A	↗
	Migration	N/A	N/A	N/A	↘	↗	N/A	↘
	Wintering	0						
Western Siberia	**Breeding (total)**	**150–320**	5	3				
	Kurgan oblast' 2012	50–100	1	4	†	↗	N/A	↗
	Omsk oblast' 2015	100–200	5	3	†	↗	↗	↗
	Altai krai 2016	0–20	2	2	†	↗	↗	↗
	Migration	1000	3	3	†	↗	↗	↗
	Wintering	0						
Totals in all areas	**Breeding**	**49 000–61 070**	17	Ave 3.5				
	Migration	100 000	14	Ave 4				
	Wintering	410–510						

follow a narrow strip along the shore of the Caspian Sea past Beshbarmag mountain in the foothills of the eastern extremity of the Greater Caucasus in Azerbaijan (Bliznyuk 1996). In 2015, 93 000 Little Bustards were counted in the Kalmyk section of this flyway (Ubushaev *et al* 2016), and 181 000 birds flew past Beshbarmag in autumn 2024 (Farajli 2025).

METHODS

This section outlines the methodology of the latest research by the authors in the most important regions for the bird's habitation, namely (within the Volga region, 1) the Republic of Kalmykia and (2) Saratov and Volgograd oblast's, in the Ural region (3) Orenburg oblast', and in western Siberia (4) a group of three disjunct regions consisting of Kurgan and Omsk oblast's and Altai krai (Korovin 2013, Nefedov 2013, Muzaev *et al* 2015, Oparin *et al* 2017, Fedosov 2019).

Republic of Kalmykia

Since 2020, AAA has kept a record of all Little Bustards (549 records) encountered in Kalmykia and adjacent provinces. These include the results of breeding transect surveys (2022–2024) in the southern Ergeni hills undertaken by car in late May and early June, covering a total of 917 km with a transect width of 500 m. In 2020–2024, over the months of December and January, we also carried out regular fixed transects of around 800 km in the Chernye Zemli (Black Earth) Nature Reserve and its surroundings, over an area of about 1000 km^2. This protected area preserves natural steppe and semi-desert landscapes known to be used by the Little Bustard.

Saratov and Volgograd oblast's

Over the past 25 years, MLO and OSO have collected data on the abundance and distribution of the Little Bustard by habitat in the breeding season and during pre-migration movements in the trans-Volga region in Saratov oblast' and the adjacent Drofinyi Sanctuary in Staropoltavsky district, Volgograd oblast', on the border with Krasnokutskii district of Saratov oblast'. We conducted comprehensive surveys in mid- to late September in the years 1998–2000, 2011–2012, 2014–2017 and 2024. This work, covering 12 000 km^2 in the dry steppe of the *syrt* (dry upland plain) in the trans-Volga region and another 500 km^2 in the Drofinyi Sanctuary, also in the *syrt*, was conducted using the method described by Oparin *et al* (2003). The survey of the larger area started in mid-September and lasted 10 days. The research team divided into six groups, two people in each, and covered the areas in four-wheel-drive vehicles using navigation tablets with 1:100 000 maps. Each group surveyed an area of 200 km^2 daily when the weather allowed, from sunrise until sunset, with breaks during the height of the day when birds are less active. The geographical coordinates of all Little Bustard records were logged using GPS, their habitats were mapped and official data on land use in Saratov oblast' were consulted.

In May 2019–2023 we conducted a series of transect surveys, using a variable transect width, in the flat semi-desert in the trans-Volga region between the Bol'shoi Uzen' and Malyi Uzen' rivers and the Bol'shoi Uzen' and Dyura rivers in the Caspian depression (Alexandrovo-Gaiskii district, Saratov oblast') to count displaying males (Bibby *et al* 1998), covering 288 km on foot and 580 km by car over the period.

In the autumn of 1998–2000, 2011–2012 and 2014–2017, we conducted comprehensive research into the abundance and distribution of Great and Little Bustards in a study area of 12 000 km^2 in the southern half of the trans-Volga region in Saratov oblast' (Figure 2). This allowed us to specify the relative numbers of the Little Bustard (Oparin *et al* 2017).

We drew the Little Bustard occupancy index from the average of birds in 100 randomly selected territorial survey units. A territorial unit covered 25 km^2 (5×5 km).

Orenburg oblast'

In May 2011, VNF conducted a transect and stationary survey (Bibby *et al* 2000) of the Little Bustard from the southern edge of the Ural mountains to the eastern border of the oblast' (Fedosov & Fedosov 2017, Fedosov *et al* 2017), covering the entirety of the Little Bustard's breeding range in the Ural region. This transect involved a straight-line distance of approximately 700 km, but the transect's total length was over 2500 km. The total number of stationary survey points was 257. Over 5–19 May 2016, VNF re-surveyed birds in this region using the same methods and consulting local game experts. By these means he confirmed and refined the species' distribution and ecology, assessed threats and outlined conservation measures.

The Little Bustard's range in the oblast' is limited mainly to *Festuca–Stipa* and *Artemisia–*cereal steppes. These habitats lie south of the Samara and Ural rivers and east of the Ural mountains (Fedosov 2019), and their total area was used to extrapolate the survey counts to infer a potential Little Bustard breeding population in the entire oblast'.

Western Siberia

AAN researched the status of the Little Bustard in the southern areas of Kurgan and Omsk oblast's and Altai krai, where it has been historically observed. Little Bustards were recorded from spring to autumn through AAN's annual fieldwork, mostly in Omsk oblast' (1995–2025, where he noted the first post-1950s record in 2000) and through consultations with other specialists.

RESULTS

Republic of Kalmykia

Breeding season

The breeding transect surveys in the southern Ergeni hills between 2022 and 2024 recorded 113 Little Bustards, with an average of 27.4 individuals/100 km² (range 15.6–46.7). Thus, compared with the 2015 benchmark of 125 individuals/100 km² in early May (see Methods), the density of the breeding population dropped roughly five-fold over the 10-year period.

A notable population decrease was also recorded in eastern Kalmykia, on the plains and sandy dunes of the Caspian seaboard. In early May 2015, 73 Little Bustards were recorded on a transect 875 km long with a 500 m detection width (250 m to each side) across the Chernye Zemli Nature Reserve and its surroundings, giving a density of 16.7 birds/100 km². Since 2020, when four clutches and broods were recorded in the reserve, there have been only a few records of lone adult birds. In general, the average population density in the breeding season in years with favourable weather (wet) did not exceed 0.92 individuals/100 km² inside the nature reserve (AAA unpubl data). These figures suggest a striking 18-fold decline in under ten years, which we attribute to the plowing of fallow lands and some virgin steppe.

Little Bustard records in Kalmykia lie primarily within large areas of virgin grass steppe, long-abandoned fields and the transitional zone between steppe and cereal fields, rather than newly plowed fields. This suggests that the current negative trend in Little Bustard numbers in Kalmykia is the result of a reduction and degradation of nesting habitats in response to human economic activity and, possibly, of a decline in food quality caused by lower cold-season rainfall. Official statistics indicate that 658 km² of virgin steppe and long-abandoned fields were lost to agriculture between 2013 and 2023, yet the numbers of free-grazing livestock remained stable, thereby increasing grazing pressure on the uncultivated steppe areas that remain along small river valleys.

Using recent Sentinel-2 satellite imagery, we measured the total area of suitable Little Bustard habitats within the Ergeni hills to be 20 851 km². Applying the average breeding density of 27.4 individuals/100 km² (mentioned in the first paragraph of this section) to this area yields a potential population of 5713 birds. Our automobile surveys during the breeding season were more likely to detect males, which display conspicuously at this time. Indeed, in the field we observed an average of one female for every five males, or in this case, 4761 males to 952 females. Owing to the survey methodology, we consider the estimated number of males, which we round to 5000, to be more accurate than the estimation of number of females. To approximate the number of females using this more reliable census of males, we apply a male:female ratio of 1:0.8. This is a more generous ratio than those of threatened but well-researched populations in Europe (Serrano-Davies *et al* 2023), since in Kalmykia the proportion of fields to pastures is very low and wheat is usually harvested only at the end of June/early July, after the breeding season is over. This yields a total estimate of 9000 (5000 males and 4000 females) in the Ergeni hills.

Meanwhile, only 16 large semi-desert sites with a total area of 8653 km² suitable for the nesting of Little Bustards were identified in eastern Kalmykia, which experiences greater aridity and higher livestock grazing. With the current nesting density of 0.92 individuals/100 km², the Caspian plains (*ie* eastern Kalmykia) cannot be inhabited by more than 80 individuals. Discounting these in order not to give a false sense of accuracy, the total size of the Little Bustard's population in the republic is posited as 9000 individuals.

Pre-migration gatherings, migration and wintering

No targeted surveys of Little Bustards were conducted during autumn migration. Owing to a steady decline in the duration of snow cover and increase in temperatures, Little Bustards spend increasingly more time in eastern Kalmykia before moving on (AAA pers obs). In the Chernye Zemli Reserve and its surroundings, 114 individuals were recorded (on the same transect as in May 2015) in the winter months of 2019/2020, two individuals in 2020/2021, 79 in 2021/2022, 482 in 2022/2023 and 41 in 2023/2024. With the exception of the abnormally warm year 2020, the largest number of Little Bustards occurs in early to mid-December. On average, these censuses yield a wintering population of Little Bustards in eastern Kalmykia of 100–200 individuals. By January, only single wintering birds (under 10 annually) usually remain in and around the reserve.

Saratov and Volgograd oblast's

Breeding season

Little Bustard numbers dropped critically in the 1990s, in response to the replacement of agricultural fields by tall weeds unsuitable for the species' breeding. Grazing fell by 70–80% compared to the Soviet period owing to a sharp reduction in livestock, and the recovery of the original rangeland vegetation was slow: only by the mid-2000s and in the 2010s was the steppe attractive enough as breeding habitat for the species once more. Such profound socio-economic reversals were observed throughout the Russian Federation in the 1990s and 2000s.

The trans-Volga semi-desert in Alexandrovo-Gaiskii district of Saratov oblast' is now occupied by moderately grazed rangelands on long-abandoned agricultural fields and virgin lands. Until 1990, 55% of the district's territory was occupied by rotational crop fields, 25% by river-fed meadows and 20% by heavily grazed rangelands. In the early 1990s, the crop fields were abandoned and livestock numbers dropped significantly (Oparin *et al* 2016). The density of male Little Bustards was low, ranging from 0.12 to 0.67 per 100 hectares, with no discernible trend ($R^2 = 0.09$).

In the spring of 2021, during our breeding surveys of displaying males, 39 Little Bustards were observed on 23 occasions in the 500 km² Drofinyi Sanctuary in Volgograd

oblast'. The sanctuary is located 130 km north of the Alexandrovo-Gaiskii district in the steppe zone. However, its protected status does not give it the power to regulate economic activities, and land use is typically around 70% winter and spring crops and 27% pastures (which include both virgin lands and abandoned fields) with sparse but diverse grass vegetation. Most Little Bustards (56%) were recorded in agricultural fields and 17 (44%) in pastures, highlighting the relative importance of the latter. Of all records, 18 (78%) were of single birds and 2 were 'pairs', with flocks of 3, 4 and 10 individuals registered once each. All the recorded birds were males, so we use a ratio of 1 male to 0.8 females to calculate the total population (thus 39 + 31 = 70), based on evidence that female mortality is likely to be higher than male because of the risks associated with agricultural machinery during incubation, although most breeding in the area is done either on fallow agricultural land or in virgin land/pastures, arguably leading to lower casualty rates than in the more intensively farmed landscape where this issue is most often investigated (Serano-Davies *et al* 2023).

The Little Bustard formerly bred on the right bank of the Volga in Saratov oblast' and adjacent areas in Volgograd oblast', but our repeated autumn surveys and regular interviews with game guards demonstrated that it had completely stopped nesting there by 2010 (Khrustov & Shlyakhtin 2006).

Based on our fieldwork across Saratov oblast' since 1995, we posit that some 5000–10 000 male Little Bustards are present on the left bank each breeding season. Applying a sex ratio of 1:08 we thus estimate the Little Bustard population in Saratov oblast' at 9000–18 000 individuals.

Pre-migration aggregations and migration

We also surveyed the 12 000 km^2 study area in the dry steppe of the *syrt* plain in the trans-Volga part of Saratov oblast' in the autumn of 2017, counting 3889 Little Bustards in 55 flocks. Groups of up to 100 birds comprised 80%, 101–200 9.1%, and 201–400 10.9% of the total. We mapped all Little Bustard records, revealing that the density of the species in the pre-migration period increases from the west (0.3 individuals/100 ha) through the east and south (0.4 individuals/100 ha) to the south-east (0.6 individuals/100 ha). This area is characterised by a gently undulating landscape covered with *Festuca–Stipa* communities and sparse grass, with *solonetz* occupying 10–20% of its area. Up to 80% of this area is occupied by agricultural fields. In the west of the area, almost all fields are currently in use, while abandoned fields make up 20–30% in the south and east, accounting for the higher density of Little Bustards there, given their preference for virgin areas and abandoned fields.

We conducted no comprehensive autumn surveys from 2018 to 2023 as we focused then on the breeding period, so we cannot estimate further dynamics in the numbers of Little Bustards in the pre-migration period. However, in autumn 2024 we counted only 303 individuals at 17 sites across 12 000 km^2 of this area, forcing us to conclude that the species has undergone a genuine decline. This assumption was supported by Dr AV Bykov (pers comm) based on his own observations in 2022–2024 in the vicinity of lake El'ton, located in the semi-desert of the Volgograd Volga region, as well as by Prof VP Belik (pers comm), who worked west of Lake El'ton in 2022.

Orenburg oblast'

The Little Bustard is distributed unevenly in Orenburg oblast'. Towards the west it decreases in abundance, being unrecorded north of Kurmanaevskii district and not breeding on two watershed ridges in the Samara–Ural interfluve. Lands in the north-east of the oblast' (north of the Ural river) are widely cultivated while river valleys

Figure 2. Saratov oblast' showing the study site in the trans-Volga part of Saratov oblast' (red outline) where the Little Bustards were counted. The Volga river is in blue.

are occupied by meadows, fragmenting the range into small patches. East of the Ural mountains, it is common in all districts of the oblast', even spilling over in small numbers into Bashkortostan and southern Chelyabinsk oblast'. The species was found to prefer landscapes in which cultivated fields adjoin steppe, fallows and abandoned fields.

The field survey in 2017 recorded 282 birds with an average density of adult males of 1.5 individuals per 1 km^2, similar to that found in May 2011. Extrapolation to the estimated area of all suitable habitats within Orenburg oblast' results in 75 000 individuals (Fedosov 2019), but local ornithologists from Orenburg Pedagogical University do not find the Little Bustard distributed across the entirety of this habitat, and estimate a Little Bustard population of 3000 individuals in the oblast' (Kornev & Gavlyuk 2019). Reasons for this disparity likely include spatial heterogeneity in reduction of threats which led to the near-extirpation of the species, and an insufficient period for the species to refill the extent of its ecological niche.

This region includes the Orenburg Nature Reserve, which is intended to protect unique steppe ecosystems and their components, including the Little Bustard. The total area of its five steppe clusters is 382 km^2. In 2016, the density of Little Bustards within the protected area was found to be only 0.2 individuals/km^2, whereas outside the reserve it was 1.5 individuals/km^2 (Fedosov 2019). Unchecked by economic activity and currently uninhabited by wild ungulates, the reserve has taller, thicker grass, shrubs and accumulations of dead plants, preventing the birds from mating and feeding. Paradoxically, therefore, the conservation status of the Little Bustard is currently impaired rather than improved by the reserve.

Western Siberia

Information is far too sparse to provide a reliable synopsis of the status of the Little Bustard in this huge region. Material gathered by AAN for this review itemises the districts in three administrative divisions, all bordering Kazakhstan, where the species

occurs: three southern districts (Tselinnyi, Zverinogolovskii and Kurtamyshskii [shaded in Figure 1], with single records from Ketovskii, Pritobol'ny and Polovinskii) of Kurgan oblast' bordering Kazakhstan's Kostanay region; the five south-easternmost districts (Pavlogradskii, Russko-Polyanskii, Novovarshavskii, Okoneshnikovskii and Cherlakskii [shaded in Figure 1]) of Omsk oblast' near Kazakhstan's Pavlodar region; and two (Loktevskii and Uglovskii, shaded in Figure 1) in Altai krai. The absence of the species in the two adjacent districts forming south-westernmost Novosibirsk oblast', which separates Omsk oblast' from Altai krai, may simply reflect an absence of survey work, although this gap is also predicted by niche modelling to occur on the Kazakhstan side of the border (Koshkin *et al* 2025). Clearly more comprehensive fieldwork is needed to provide an overall status update on the situation in the region.

Regular monitoring in Omsk oblast' by AAN between 1997 and 2023 has produced the largest number of records of Little Bustards in Western Siberia, with little geographical change in distribution and important sites over this time and indeed since studies in the late 19th century (Ruzskii 1897). Breeding sites were found in two districts in 2000, three in 2002, four in 2004–2013 and five in 2024 (AAN pers obs). Okoneshnikovskii and Cherlakskii districts share the Stepnoi Sanctuary, an important location for the species. Distances between sites used by Little Bustards in the oblast' range from 10 to 100 km. Up to 2004, there were oral reports of flocks of up to 40 birds in the south of the oblast', and in early October that year a large pre-migration aggregation, up to 200 birds, was seen in Russko-Polyanskii district. After 2004, however, population growth ceased owing to increasing poaching activity (Nefedov 2007, 2013).

DISCUSSION

The evidence assembled here shows that more targeted studies of the Little Bustard's distribution and population dynamics are needed across the relevant regions of Russia. Most records of and data on the species have been gathered during surveys of other steppe birds. A few specific studies have been conducted in certain regions (north Caucasus, the southern Volga–Don interfluve, lower Volga, Orenburg oblast', southern Urals and Western Siberia), almost all of them between 1990 and 2017. The diverse methods used in the studies are not always described in sufficient detail, with only expert estimates of the abundance provided in many cases. Nevertheless, these give an idea of the current distribution and abundance of the Russian populations of the Little Bustard and their distribution across habitats during the breeding season, post-breeding movements and migrations to wintering grounds. Based on these studies, we posit a breeding population for the Russian Federation of 49 000 to 61 000 individuals (Table 1).

The data we provide suggest that most of the species' breeding populations in Russia are concentrated in the north Caucasus region including the Republic of Kalmykia; Volga–Don interfluve and Rostov and Astrakhan' oblast's; lower Volga region in Volgograd and Saratov oblast's, mainly in on the right bank of the Volga; Orenburg oblast', mainly in the south-east along the Kazakhstan border; Kurgan and Omsk oblast's and the Altai krai. In other steppe regions of Russia the species is either unrecorded or extremely rare.

Compared to the Soviet era, particularly its last decade, Little Bustard numbers have increased today even as its range has contracted owing to the loss of its territories in the Central Black Earth region (Penza and Ulyanovsk oblast's and Republic of Tatarstan). The growth is associated with a fall in agricultural production and grazing in the 1990s that initially reduced available habitats further, but by the mid and late 2000s led to the restoration of rangelands and plant communities favourable to the species.

Nevertheless, most regional populations across Russia are currently in decline. The main threats to Russian Little Bustard populations are: 1. (re-)intensification of

agricultural production, including the use of chemical biocides; 2. conversion of long-abandoned fields and virgin lands to oil-bearing and winter cereal crops; 3. collisions with overhead powerlines; and 4. illegal hunting in pre-migration flocking areas and on wintering grounds. Although 3 and 4 are recognised as threats in Russia, dedicated research is needed to quantify their impact and identify hotspots.

The Little Bustard benefits from the protection afforded by the Rostov, Chernye Zemli and Dagestan Nature Reserves, plus many steppe federal and regional sanctuaries in the Russian Federation. However, the plowing-up of rangelands must be stopped and the cultivation of perennial fodder grasses and spring cereals and legumes encouraged. This would require monetary compensations to farmers, although this is an issue that has not been resolved in the nature conservation legislation of the Russian Federation.

ACKNOWLEDGEMENTS

The authors express their thanks to AB Mamaev and OA Ruban for participating in the collection of material and preparation of some illustrations in this article. Translation of the original Russian version was provided by Shamil Gareev.

LITERATURE CITED

Akseev, IV, DN Galimova & OV Akseev. 2016. [Little Bustard.] *In:* [*Red Data Book of the Republic of Tatarstan. Animals, plants, mushrooms*.] 3rd edition. Ideal Press, Kazan', p235. [In Russian]

Anon. (ed.) 2005. [*Red Data Book of the Penza Oblast'*.] Vol. 2. Animals. 2nd edition. Penzenskaya Pravda, Penza. [In Russian]

Archimaeva, TP & VI Zabelin. 2015. [Encounters with the Little Bustard *Tetrax tetrax* in south-western Tuva.] *Russian Ornithological Journal* 24(1120): 980–981. [In Russian]

Artem'eva, EA, AV Maslennikov & MV Korepova (eds). 2015. [*Red Book of Ulyanovsk Oblast'*.] Buki Vedi, Moscow. [In Russian]

Batkhiev, AM & TYu Tochiev. 2007. [Little Bustard.] *In:* [*Red Data Book of the Republic of Ingushetia. Plants, animals*.] Serdalo, Magas, pp279–280. [In Russian]

Belik, VP. 2013. [On the summer avifauna of the Bogdo-Baskunchak Nature Reserve and its surroundings.] In: *Studies of the natural complex of the Baskunchak lake area*. Volgograd, pp27–34. [In Russian]

Belik, VP. 2014. [Little Bustard.] In: *Red Data Book of Rostov oblast'*. Vol. 1. Animals. 2nd edition. Ministry of Natural Resources of Rostov Oblast', Rostov-on-Don, pp1072–1077. [In Russian]

Bibby, C, M Jones & S Marsden. 1998. *Expedition Field Techniques: Bird Surveys*. Royal Geographical Society, London.

Bliznyuk, AI. 1996. [Little Bustard migration through Kalmykia.] *Ornithology* 27: 279–280. [In Russian]

Chernobai, VF & SA Bukreev. 2017. [Little Bustard.] In: *Red Data Book of Volgograd oblast'*. Vol. 1. Animals. 2nd edition, revised and updated. Izdat-Print, Voronezh, p152. [In Russian]

Collar, NJ & M Kessler. 2021. Hunting of Little Bustards *Tetrax tetrax* in Azerbaijan: the global conservation perspective. *Sandgrouse* 43: 281–285.

Dement'ev, GP. 1952. [*Birds of Turkmenistan*.] Vol. 1. Academy of Sciences of the Turkmen SSR, Ashgabat. [In Russian]

Dzhamirzoev, GS, SA Bukreev, RM Barkhalov, LF Mazanaeva, YuA Yarovenko, KM Kuniev, SA Plaksa, AG Perevozov, SV Gazaryan, AD Askenderov, NI Nasrulaev, EA Babaev & AYu Yarovenko. 2013. [Rare vertebrate animals of the Dagestan Nature Reserve.] *Materials of the Dagestan Nature Reserve* 6. Makhachkala, 372 pages. [In Russian]

Dzuev, RI. 2000. *In:* [*Red Data Book of the Kabardino-Balkarian Republic.*] Tl-Fa, Nal'chik, p82. [In Russian]

Farajli, Z. 2025. Assessing the wintering population and conservation challenges of the Little Bustard *Tetrax tetrax* in Azerbaijan. *Sandgrouse* 47: 87–101.

Fedosov, VN. 2019. [The current state of Little Bustard populations in Orenburg oblast' and other parts of its range.] *Strepet* 17, 1: 4–66. [In Russian]

Fedosov, VN & LV Malovichko. 2018. [Modern distribution of the Little Bustard in Stavropol'.] *Russian Ornithological Journal* 27(1706): 5991–5998. [In Russian]

Fedosov, VN, AV Fedosov & AN Antonchikov. 2017. [Surveys of the Little Bustard in Orenburg Oblast' and prospects for its protection.] *Steppe Bulletin* 49: 55–58. [In Russian]

Finogenov, OV. 2007. [Little Bustard's ecology in semi-deserts and deserts in the south of the lower Volga region.] Abstract from a PhD thesis. Astrakhan'. [In Russian]

Gashek, VA & AS Chichkova. 2014. [Little Bustard.] In: *Red Data Book of the Republic of Bashkortostan*. Vol. 2. Animals. 2nd edition, updated and revised. Informreklama, Ufa. [In Russian]

Gauger, K. 2007. Occurrence, ecology and conservation of wintering Little Bustards *Tetrax tetrax* in Azerbaijan. *Archiv für Naturschutz und Landschaftsforschung* 46: 5–27.

Gizatulin, II. 2020. [Little Bustard.] *In: Red Data Book of the Chechen Republic*. 2nd edition. Yuzhny Publishing House, Rostov-on-Don, pp415–416. [In Russian]

Heiss, M & K Gauger. 2011. Coastal bird migration at the Caspian shore of the Azerbaijan Republic in October 2007. *Podoces* 6: 59–71.

Heiss, M, K Gauger, C Himmel, P Fetting, TA Haraldsson, G Caucal, Z Fərəcli & E Sultanov. 2020. The development of the Besh Barmag Bird Migration Count in Azerbaijan and its importance for the monitoring of Eurasian migrant birds. *Sandgrouse* 42: 29–45.

Isakov, YuA & KA Vorobyov. 1940. [Overview of the wintering and migration of birds in southern Caspian area.] *Materials of the Khasan-Kuli Reserve* 1: 5–159. [In Russian]

Isakov, YuA & VE Flint. 1987. [Family Otididae.] In: *Birds of the USSR. Galliformes, Gruiformes*. Nauka, Leningrad, pp465–502. [In Russian]

Karavaev, AA & AB Khubiev. 2013. *In:* [*Red Data Book of the Karachay-Cherkess Republic.*] Nartizdat, Cherkess, p124. [In Russian]

Khrustov, AV & GV Shlyakhtin. 2006. [Little Bustard.] *In: Red Data Book of Saratov oblast'. Fungi. Lichens. Plants. Animals*. Publishing House of the Chamber for Trade and Industry of Saratov oblast', Saratov, pp428–429. [In Russian]

Kornev, SV & EV Gavlyuk. 2019. [Little Bustard.] *In: Red Data Book of Orenburg oblast'. Rare and endangered species of animals, plants, and fungi: official publication*. Mir, Voronezh, pp149–150. [In Russian]

Korovin, VA. 2001. [Bird population dynamics in the steppe agricultural landscape associated with changes in land use.] *Achievements and Problems of Ornithology in Northern Eurasia at the Turn of the Century*. Proceedings of the 11th International Ornithological Conference. Matbugat Iorty, Kazan', pp468–477. [In Russian]

Korovin, VA. 2004. [*Birds in the agricultural landscapes of the Urals*.] Publishing House of Ural University, Yekaterinburg, 504 pages. [In Russian]

Korovin, VA. 2013. [Restoration of the Little Bustard population in the north of the steppe trans-Urals.] *Volga Ecological Journal* 1: 51–60. [In Russian]

Koshkin, MA, R Urazaliyev & BM Gubin. 2025. Populations of Little Bustards *Tetrax tetrax* in Kazakhstan have rebounded following a period of agricultural abandonment. *Sandgrouse* 47: 111–121.

Kotlov, AA. 2015. [On the distribution of rare birds in the south-west of Kulunda.] *Altai Zoological Journal* 9: 69–71. [In Russian]

Kreuzberg-Mukhina, EA & EN Lanovenko. 2003. [About the wintering of the Little Bustard in Uzbekistan.] *Strepet* 1: 5–9. [In Russian]

Kuzovenko, AE & GP Lebedeva. 2018. [Little Bustard.] In: *Red Data Book of Samara Oblast'*. Vol. II. Rare species of animals. Publishing House of the Nayanova Samara Regional State Academy, Samara, p256. [In Russian]

Lindeman, GV, BD Abaturov, AV Bykov & VA Lopushkov. 2005. [*Vertebrate population dynamics in the trans-Volga semi-desert*.] Nauka, Moscow, 252 pages. [In Russian]

Lokhman, YuV. 2017. [Little Bustard.] *In: Red Data Book of Krasnodar krai. Animals*. 3rd edition. Administration of Krasnodar Krai, Krasnodar, pp552–553. [In Russian]

Malovichko, LV, VN Fedosov. 2006. [Current state of the Little Bustard population in Stavropol' krai.] *Development of modern ornithology in northern Eurasia*. Proceedings of the 12th International Ornithological Conference of Northern Eurasia. Stavropol', pp485–497. [In Russian]

Muzaev, VM, VE Badmaev, BI Ubushaev & GI Erdnenov. 2015. [On the current population of Otididae in Kalmykia.] *Steppe Birds of the Northern Caucasus and Adjacent Regions: Study, Use, Protection*. Proceedings of the international conference. Rostov-on-Don, pp121–134. [In Russian]

Nefedov, AA. 2013. [Otididae in Omsk Oblast'.] *Steppe Bulletin* 38: 44–47. [In Russian]

Oparin, ML, IA Kondratenkov & OS Oparina. 2003. [The size of the trans-Volga population of the Great Bustard *Otis tarda*.] *Bulletin of the Russian Academy of Sciences. Biological Series* 6: 675–682. [In Russian]

Oparin, ML, IA Kondratenkov, OS Oparina & AB Mamaev. 2017. [Little Bustard population in Saratov oblast'.] *Volga Ecological Journal* 2: 157–169. [In Russian]

Oparin, ML & OS Oparina. 2021. [Little Bustard.] *In: Red Data Book of Saratov Oblast'. Fungi. Lichens. Plants. Animals.* Ministry of Natural Resources and Environment of Saratov Oblast'. Papirus, Saratov, p397. [In Russian]

Oparin, ML, OS Oparina & LS Trofimova. 2016. [*Patterns of bioresources dynamics in steppe landscapes*.] Publishing House of Saratov University, Saratov, 204 pages. [In Russian]

Oparin, ML & VN Fedosov. 2021. [Little Bustard *Tetrax tetrax* Linnaeus, 1758.] In: [*Red Data Book of the Russian Federation. Animals*.] 2nd edition. VNII Ekologiya, Moscow, pp700–702. [In Russian]

Oparina, OS & ML Oparin. 2020. [Impact of intensive agricultural production in the trans-Volga part of Saratov oblast' on Little and Great Bbustard populations.] In: *Biodiversity and Anthropogenic Transformation of Natural Ecosystems*. Edited by MA Zanin. Saratovsky Istochnik, Saratov, pp57–63. [In Russian]

Pavlov, SI, VM Shaposhnikov, GP Lebedeva, DV Magdeev, SV Simak, EN Dubrovskii & VP Yasyuk. 2009. [Little Bustard.] In: *Red Data Book of Samara Oblast'*. Vol. 2. Togliatti, p270. [In Russian]

Reutskii, ND. 2014. [Annotated list of birds in Astrakhan' Oblast' with data on their distribution across natural complexes (part two).] *Astrakhan' Bulletin of Environmental Education* 28, 2: 121–159. [In Russian]

Rustamov, EA. 2013. [Summary of modern avifauna in Turkmenistan.] *In:* Sopyev, OS & ShR Herremov (eds). *Study of the Biodiversity of Turkmenistan (Vertebrates)*. Scientific collection. (Dedicated to the 95th anniversary of AK Rustamov and 60th anniversary of EA Rustamov). Moscow–Ashkhabad, pp125–171. [In Russian]

Ruzskii, M. 1897. [Brief faunistic overview of the southern strip of Tobol'sk province (Report to Mr. Tobol'sk Governor on zoological surveys conducted in 1896).] *Yearbook of the Tobol'sk Provincial Museum* VII. Tobol'sk Provincial Printing House, Tobol'sk, pp37–82. [In Russian]

Saparmuradov, D. 2011. Little Bustard. *In:* [*Red Data Book of Turkmenistan*.] Ylym, Ashgabat, pp274–275. [In Russian]

Serrano-Davies, E, J Traba, B Arroyo, F Mougeot, F Cuscó, S Mañosa, G Bota, N Faria, A Villers, F Casas, C Attié, P Devoucoux, V Bretagnolle & MB Morales. 2023. Biased adult sex ratios in Western Europe populations of Little Bustard *Tetrax tetrax* as a potential warning signal of unbalanced mortalities. *Bird Conservation International* 33: e40.

Sokolov, AS & GA Lada. 2012. [Little Bustard.] In: *Red Data Book of Tambov Oblast'. Animals* (2nd ed). Yulis, Tambov, p265. [In Russian]

Spangenberg, EP. 1951. Otidiformes. *In*: *Birds of the Soviet Union*. Vol. II. Sovetskaya nauka, Moscow, pp139–168. [In Russian]

Tarasov, VV. 2011. [The status of rare bird species in Kurgan oblast'.] *Materials on the Distribution of Birds in the Urals, Cis-Ural Area and Western Siberia* 16. Publishing House of Ural University, Yekaterinburg, pp110–139. [In Russian]

Ubushaev, BI, VYa Badmaev, GI Erdnenov, VM Muzaev & PA Medzhidov. 2016. [Final assessment of the Little Bustard's breeding and migrating populations in the Republic of Kalmykia.] Research report dated November 5, 2015. Ministry of Natural Resources and Environment of the Russian Federation. Chornye Zemli State Nature Biosphere Reserve. Komsomol'skii, Republic of Kalmykia, 30 pages. [In Russian]

Vengerov, PD. 2005. [*Birds and Little-used Agricultural Lands in Voronezh Oblast'*.] Voronezh, pp152. [In Russian]

Vereshchagin, NK. 1940. [Wintering of the Little Bustard *Otis tetrax* L. and Great Bustard *Otis tarda* L. in eastern Transcaucasia.] *Bulletin of the Azerbaijan branch of the Academy of Sciences of the USSR* 5: 57–65. [In Russian]

Mikhail Lvovich Oparin, Saratov branch of Severtsov Institute of Ecology and Evolution under the Russian Academy of Sciences, 24 Rabochaya St., Saratov 410028. Russia, e-mail: oparinml@mail.ru

Olga Sergeyevna Oparina, Saratov branch of Severtsov Institute of Ecology and Evolution under the Russian Academy of Sciences, 24 Rabochaya St., Saratov 410028. Russia, e-mail: oparinml@mail.ru

Anton Alexandrovich Abushin, Chornye Zemli Nature Reserve under the Ministry of Natural Resources of the Russian Federation, Kalmykia, Chernozemelsk, Russia, e-mail: kalmykianbubo@gmail.com

Viktor Nikolayevich Fedosov, All-Russian Society for Nature Conservation, 35/1 Shosseynaya Street, Divnoye, Stavropol' Krai, Russia, e-mail: viktor_fedosov@mail.ru

Alexander Alexeyevich Nefedov, Omsk branch of the Russian Geographical Society, email: anefyodov2007@mail.ru