# The steady decline of the Great Bustard Otis tarda tarda in the Russian Caucasus

VIKTOR FEDOSOV & GADZHIBEK DZHAMIRZOYEV

**Summary:** In the lowland semi-desert and steppe areas (Ciscaucasia) of the northern Caucasus of Russia the Great Bustard *Otis tarda tarda* was a common breeder and, in places, an abundant passage migrant and winter visitor. Starting in the late 19th century the spread and later intensification of agriculture steadily converted the steppe areas, such that breeding populations are now confined to only three areas (Taman' peninsula, east coast of Sea of Azov, and westernmost Kalmykia) involving tiny numbers (total probably 10–15 pairs). Meanwhile wintering visitors from areas of Russia to the north have also greatly declined from thousands to tens of birds.

## INTRODUCTION

The Great Bustard *Otis tarda tarda* was formerly a common, widely distributed steppe bird in the northern Caucasus, Russia. Until the late 19th century, most of the bird's original habitats in this region changed little. Initially, it appeared unaffected by anthropogenic encroachment and was recorded all year round (Bogdanov 1879). It continued to breed in virgin steppe, whereas in the middle part of Russian and Western Europe it adapted to living in agricultural fields (Menzbir 1900). Females made their nests in ample untilled steppe areas (II'in 1905), less often near cereal fields. Birds foraged in hayfields, stubble fields, newly plowed fields and areas with short and sparse vegetation. Females raised their chicks in areas far from human disturbance, where they could easily anticipate threats and search for food (Dinnik 1886).

There were major wintering grounds in the northern Caucasus. Some of the birds migrating from the middle and southern portions of Russia stopped over in the Caucasus, the rest in Crimea (Menzbir 1900). In autumn, flocks of 100–150 Great Bustards appeared in fields all across the steppe, and with the first snowfall the migration intensified: enormous flocks arrived one after another, and when snow covered most of the territory the birds moved to higher ground with gullies and ravines where the wind kept the ground free of snow (Dinnik 1886). Wintering flocks comprised 200–300 birds (Rossikov 1884, Il'in 1905). Lorenz (1887) recorded considerable numbers on the Borgustan mountain plateau and ridge south-west of the city of Kislovodsk, and reported the species as very common in the steppe valley of the Kuban' river in the west of Ciscaucasia, where birds stayed throughout mild winters.

In the second half of the 19th century, peasants from central Russia moved to the Caucasus, sparking population growth and agricultural development. Cultivation of the Ciscaucasian steppes expanded in the 20th century, particularly in its second half. More virgin steppes were tilled, chemicals became widely used to fight pests and plant diseases, and manual labour was largely replaced by machines, resulting in a sharp growth in the numbers of cars, trucks and tractors in the steppe. But what is the effect of these economic and infrastructural changes on the Great Bustard population in this region?

## METHODS

No comprehensive studies have been made of the Great Bustard population in the Russian Caucasus. Most information about this bird has accumulated incidentally during various ornithological excursions and surveys. We used data from the annual winter surveys of birds and mammals conducted by the regional hunters' associations. We also interviewed local people, hunters and other ornithologists, and checked the literature. This generated considerable material that has allowed us to establish the bird's status and abundance in regions we did not visit and track its long-term population dynamics.



**Figure 1.** Map of the Russian Caucasus, showing current breeding areas of the Great Bustard (green circles with codes: 1.1 Taman' peninsula; 1.2 eastern coast of the Sea of Azov; 1.3 Zamanych'e, agricultural landscapes in the south of Rostov oblast' and western part of Kalmykia). Smaller single numbers indicate administrative divisions: I Rostov oblast', 2 Krasnodar krai, 3 Republic of Adygea, 4 Republic of Karachay-Cherkessia, 5 Stavropol' krai, 6 Republic of Kalmykia, 7 Republic of Kabardino-Balkaria, 8 Republic of Northern Ossetia-Alania, 9 Republic of Ingushetia, 10 Republic of Chechnya, 11 Republic of Dagestan. The northern red line indicates the border of the northern Caucasus (runs along the Kumo-Manych depression). The lower red line divides lowland Ciscaucasia from the Greater Caucasus mountain system.

The Russian Federation encompasses the northern Caucasus as far south as the Greater Caucasus watershed and, in the west, part of the southern Caucasian macroslope (Figure 1). The Great Bustard mostly inhabits Ciscaucasia—the lands to the north of the Greater Caucasus. In the north Ciscaucasia is bordered by the Kuma-Manych depression, in the west by the Sea of Azov and the Black Sea, and in the east by the Caspian Sea. The region stretches for about 900 km east to west and about 300 km north to south.

The climate of Ciscaucasia is moderately continental, formed by humid Atlantic and Mediterranean air masses and dry continental air currents arriving from Central Asia. Summers are very warm, winters moderately cold, with a thin unstable snow cover. The landscape grades southwards from level semi-desert in the north-east through steppe to forest steppe in the foothills of the central southern parts. Around half the semi-desert and almost all the steppe is cultivated. Natural steppe vegetation survives in a few places, largely concentrated on the slopes of gullies and hills.

Ciscaucasia lies entirely within the Russian Federation and includes the following regions: Stavropol' krai, north-western Krasnodar krai and the Adygea republic, southeastern Rostov oblast', south-western Kalmykia republic and lowlands in the republics of Karachai-Cherkessia, Kabardino-Balkaria, North Ossetia, Ingushetia, Chechnya and Dagestan (Figure 1).

### RESULTS

In the first half of the 20th century, the Great Bustard was still common in the northern Caucasus and was even abundant in certain periods (Spangenberg 1951a). In 1927, Russian zoologists studying the vertebrate fauna of Kalmykia recorded large flocks of Great Bustards in the west of the region (Orlov 1928). Until 1945–1946 in the steppe near Manych lake there was a large Great Bustard breeding population, which in autumn gathered into large flocks in the same area (Spangenberg 1951b). At around that time, in Krasnodar krai the species bred on the coastal areas of the Sea of Azov, with occasional pairs recorded more or less regularly in the low-lying areas of the Kuban' valley (Ochapovskii 2017). However, the birds were less numerous in the semi-desert in the north of Dagestan in the breeding season, with only a few pairs recorded (Beme 1925, Turov 1952). After World War II agriculture began to develop rapidly, with the cultivation of large areas of virgin steppe, negatively impacting the Great Bustard population. In May 1950, an expedition crossing Stavropol' krai from south to north recorded only one individual (Spangenberg 1951b). Similar changes were observed in other regions: by the mid-20th century the Great Bustard no longer bred in Kabardino-Balkaria (Molamusov 2017).

Nevertheless, wintering and migrating populations of the Great Bustard maintained their numbers in the northern Caucasus. Ciscaucasia was crossed by major flyways, one following the Caspian littoral through Dagestan, one along the Black Sea coast in Krasnodar krai, and a smaller central one passing across the mountains (Spangenberg 1951a, Gambarov 1954, Dzhamirzoyev 2002). Along the Caspian coast lowlands and in the lower stretches of the Sulak and Terek rivers flocks of up to a thousand Great Bustards used to settle in winter and spring (Beme 1925, Isakov & Sazonov 1947, Bannikov 1948, Pishvanov 1986), but when snow fell they moved south over lowland areas or even into the mountains along river valleys (Krasovskii 1932, Dzhamirzoyev 2002). On the Black Sea coast many wintered in the lowlands and foothills of Krasnodar krai, with flocks of 12–50 often observed in the region in the 1960s (Ochapovskii 2017). In the mid-20th century, in Kabardino-Balkaria (on the central flyway), although not recorded every year, Great Bustards sometimes visited in large numbers for the winter, forming flocks of 5–20, more rarely 40 individuals (Molamusov 2017).

Overall, in the early second half of the 20th century, the Great Bustard in the northern Caucasus had the status of a rare breeding but common passage and wintering bird. In the cold season its numbers remained high owing to the immigration of better-preserved populations from Saratov and Volgograd oblast's of Russia and from Kazakhstan. Nevertheless, wintering flocks became smaller: having consisted a hundred years earlier of 100–300 individuals (Rossikov 1884, Dinnik 1886, Il'in 1905), in the second half of the 20th century they dropped to 5–50 individuals in size (Molamusov 2017, Ochapovskii 2017). In Dagestan, despite the favourable wintering conditions, the population of the species decreased rapidly in the 1960s and after that decade there were just occasional records in the region (Dzhamirzoyev 2002).

In the Caucasian foothills the decline of the Great Bustard became apparent in the 1980s. In the late 20th century birds stopped breeding in Stavropol' krai. The last reliable record was in 1988: a pair of Great Bustards was seen in fields near the city of Stavropol' in May and June, and in late July a machine operator caught their fledgling (Bicherev & Skiba 1990). Great Bustards have not been seen in the breeding period since; nor are there any data on their breeding in Adygea, Karachai-Cherkessia, Kabardino-Balkaria, North Ossetia, Chechnya and Dagestan—all regions where the species formerly bred. Currently, the Great Bustard nests only in three areas of the Russian Caucasus: on the Taman' peninsula; on the east coast of the Sea of Azov in Krasnodar krai; and in the farmed



**Plate I.** A male Great Bustard wintering near the village of Divnoe, Stavropol' krai, December 2019. Winter wheat fields alternate with *Artemisia* pastures. © *Viktor Fedosov* 

landscapes to the south of Manych lake in adjacent areas of Rostov oblast' and westernmost Kalmykia (Figure 1) (Lokhman & Gozhko 2020). Seven years ago, near the town of Gorodovikovsk, Kalmykia, local people observed up to 6 males displaying courtship behaviour, and once encountered a female with a chick.

Since the late 20th century, wintering populations have also decreased strongly in the northern Caucasus. In the steppes of the Manych depression over the last 20 years we recorded a total of just 14 birds (once 7 together, otherwise 1-2) on five occasions. In December 2004 up to 100 individuals visited westernmost Kalmykia, but in 2019/2020 only nine wintering birds were recorded there (BI Ubushaev, verbally). According to hunters, numbers dropped sharply in all seasons in Krasnodar krai 40-50 years ago, so that the species became rare in the region, even in winter. This century wintering birds have almost completely disappeared from Stavropol' krai, where once they occurred in large numbers, with as many as 1000 birds wintering in the semi-desert areas in the east of the

region as late as the 1980s (Khokhlov & Vitovich 1990). In southern Stavropol' krai in 1995–2006 just five encounters were logged, each time of only 3–8 birds (Parfenov 2007), while across Stavropol' krai in 2006–2012 hunters recorded between 1 and 25 individuals, 13 on average, during regional winter bird surveys (Drup & Drup 2012). In Dagestan, since 1995, there have been only 10 records of the Great Bustard, a total of 100 individuals, although in the south of the republic 50 birds were seen foraging on a dry piedmont steppe in November 2015. Currently, only single vagrant individuals are recorded in the largely mountainous republics of Adygea, Karachai-Cherkessia, Kabardino-Balkaria, North Ossetia, Ingushetia and Chechnya. Single wintering individuals and, more rarely, pairs are recorded in river valleys at the Black Sea coast (Til'ba 2007). Almost all our records were made in autumn and winter, and only one flock of 18 Great Bustards was observed in March, with birds foraging in cereal fields, semi-desert rangelands or dry steppe (Plate 1).

### DISCUSSION

In the Russian Caucasus the Great Bustard is now a very rare breeding and rare passage and wintering bird. The breeding population has shrunk to three small areas and probably does not exceed 10–15 pairs (Ubushaev 2013, Lokhman 2017); we regard it as critically endangered and fear that it may soon disappear completely.

The crisis and decline in the Russian agricultural sector in the late 20th century did not have a positive impact on the Ciscaucasian Great Bustard population, other than that the spread of the Crimean population produced a slight growth in the number of pairs on the Taman' peninsula (Lokhman & Gozhko 2020). The rest of the region showed only population declines. Illegal hunting and powerline collisions have held numbers back, and now Russian agriculture has resumed development. Modern crop-growing technologies appear to have led to a strong reduction in the abundance of invertebrates in agricultural fields, which Great Bustards commonly use to nest in, depriving the growing chicks of a key food resource.

Winter conditions in the northern Caucasus remain suitable for Great Bustards. The warming of the climate has resulted in a shorter snow cover period, which makes large areas with winter wheat available for the species. Nevertheless, wintering birds are rare in all parts of the region. This is probably due to the low numbers of birds migrating from Kazakhstan.

| Season    | Number of Great Bustards | Number of sites | Quality of estimate,<br>from I (low-quality)<br>to 5 (high-quality) |
|-----------|--------------------------|-----------------|---|
| Breeding  | 20–30                    | 3               | Low   |
| Migration | 100                      | 15              | Low   |
| Wintering | 50                       | 15              | Low   |

Table 1. Expert evaluation of the current Great Bustard population in the northern Caucasus.

#### LITERATURE CITED

- Bannikov, AG. 1948. [On the wintering of terrestrial birds in the northern part of the western Caspian coast.] *In: Nature Conservation. Collection 3.* Moscow, pp49-58. [In Russian]
- Beme, LB. 1925. [Results of Ornithological Excursions to Kizlar District of Dagestan in 1921–22.] Vladikavkaz. [In Russian]
- Bicherev, AP & SB Skiba. 1990. [Notes about rare and little-studied birds in Stavropol' krai.] *In: Little-Studied Birds of the Northern Caucasus.* Stavropol' Pedagogical Institute, Stavropol', pp. 160-161. [In Russian]
- Bogdanov, MN. 1879. [Birds of the Caucasus.] *Proceedings of the Society of Naturalists of Kazan' University* 8 (4): 1-188. [In Russian]
- Dinnik, NYa. 1886. [Ornithological observations in the Caucasus.] Proceedings of the Saint Petersburg Naturalist Society 17: 260-378. [In Russian]
- Drup, VD & AI Drup. 2012. [On the issue about the current numbers and distribution of the Little and Great Bustards in Stavropol' krai.] *Caucasian Ornithological Bulletin* 24: 27-32. [In Russian]
- Dzhamirzoyev, GS. 2002. [Great Bustard in Dagestan.] In: Proceedings of the Scientific and Practical Conference on Great Bustard Conservation, Kharkov, 24–28 October 2001. Kharkov-Martovaya, pp47-51. [In Russian]
- Gambarov, KM. 1954. [Materials on the avifauna of the eastern portion of the southern slope of the Greater Caucasus and adjacent lowlands.] *Works by the Institute of Zoology, Academy of Sciences of the AzSSR* 17: 57-112. [In Russian]

Il'in, MA. 1905. [Great Bustard in Dagestan.] Nature and Hunting 3: 1-13. [In Russian]

Isakov, YuA & ON Sazonova. 1947. [Cold weather on birds' wintering grounds on the Caspian Sea in 1939–40.] *Scientific Methodological Notes* 9: 143-150. [In Russian]

- Khokhlov, AN & OA Vitovich. 1990. [Current status of rare bird species in Stavropol' krai and issues of their conservation.] In: Rare, Uncommon and Little-Studied Birds of the Northern Caucasus: Proceedings of the Scientific and Practical Conference. Stavropol', pp102-151. [In Russian]
- Lokhman, YuV. 2017. [Great Bustard.] In: Red Data Book of Krasnodar Krai. Part 2. Animals. Krasnodar. [In Russian]
- Lokhman, YuV & AA Gozhko. 2020. [Great Bustard.] In: Atlas of the Breeding Birds of the European Part of Russia. Fiton XXI, Moscow, pp 279-280.
- Lorenz, Th. 1887. Beitrag zur Kenntniss der ornithologischen Fauna an der Nordseite des Kaukasus. Moscow. [In German]
- Krasovskii, DB. 1932. [Materials to learn about the terrestrial vertebrate fauna of Rutul Canton of DASSR.] News of the 2nd Northern Caucasian Pedagogical Institute 9: 186-219. [In Russian]
- Menzbir, MA. 1900. [Game and Commercial Birds of European Russia and the Caucasus. Vol 1.] Moscow. [In Russian]

Molamusov, KhT. 2017. [Birds of Kabardino-Balkaria. Non-Passerines.] Taganrog, Rostov-on-Don. [In Russian]

Ochapovskii, VS. 2017. [Materials on the Avifauna of Krasnodar Krai.] Taganrog, Rostov-on-Don. [In Russian]

- Orlov, YeI. 1928. [Materials to learn about the terrestrial vertebrate fauna of Kalmykia oblast'.] *Materials to Learn about the Terrestrial Vertebrate Fauna of the Lower Volga Region*. Issue 2. [In Russian]
- Parfenov, YeA. 2007. [On some rare, passage and vagrant birds in the Caucasian Mineralnye Vody area and adjacent territories.] In: Birds of the Caucasus: Study, Conservation and Rational Use: Proceedings of the Scientific and Practical Conference Dedicated to the 25th Anniversary of the Northern Caucasian Ornithological Group. Stavropol', pp89-103. [In Russian]
- Pishvanov, YuV. 1986. [Great Bustard in Dagestan.] In: Great Bustards and Approaches to their Conservation. Moscow. [In Russian]
- Rossikov, KN. 1884. [Survey of the winter avifauna in the eastern portion of the Malka valley.] *Notes by the Academy of Sciences* 49, Appendix 4. [In Russian]
- Spangenberg, YeP. 1951a. [Great Bustard.] In: Birds of the Soviet Union. Vol 2. Moscow. [In Russian]
- Spangenberg, YeP. 1951b. [Ornithological observations at state road windbreaks in the steppes of Stavropol' krai and on Manych.] *Nature Conservation* 13: 57-65. [In Russian]
- Til'ba, PA. 2007. [On some rare and little-studied bird species in the south-eastern part of Krasnodar krai.] *Strepet* 5, issues 1-2: 5-18. [In Russian]
- Trufanov, SI & NA Khokhlov. 2011. [Notes on some wintering birds in the Yankul' depression.] *Environmental* and Historical Issues of Stavropol' Krai: Proceedings of the 16th Scientific and Practical Conference at the Krai Environmental School and the Academy of Minor Tourism and Local History. Stavropol'. [In Russian]

Turov, SS. 1952. [Essays by a Naturalist Hunter.] Moscow Naturalist Society, Moscow. [In Russian]

Ubushaev, BI. 2013. [Great Bustard.] In: Red Data Book of the Republic of Kalmykia. Vol 1. Animals. Elista. [In Russian]

Viktor Fedosov, Russian Society for Nature Conservation, 35/1 Highway Street, Divnoe, Stavropol' krai, Russia. viktor\_fedosov@mail.ru

Gadzhibek Dzhamirzoyev, Dagestan Nature Reserve, 120 Gagarin Street, Makhachkala, Dagestan republic, Russia