

The urgent need for a transboundary steppe sanctuary to secure the last Great Bustard *Otis tarda tarda* populations in western Siberia and northern Kazakhstan

ALEKSANDR ALEKSEEVICH NEFEDOV

Summary: Historically and into the first half of the twentieth century the Great Bustard was widespread and patchily abundant in steppe and forest-steppe in parts of western Siberia and northern Kazakhstan, with a focus on Omsk oblast' and adjacent areas in Kazakhstan, used by a nomadic population which did not undertake a long-distance southern migration. However, a decline began in the early 20th century and by the 1960s the species was either extinct, an uncommon vagrant or very rare everywhere in this large region. Agricultural expansion, pesticides, overgrazing, poaching, human disturbance, herders' and other free-ranging dogs, powerlines and nest predation by corvids have all played a part in this catastrophic decline. The situation was briefly reversed in Omsk oblast' in the decade 2000–2010, when a very small population attempted to re-establish itself in several districts following reductions in grazing, cultivation, pesticide use and human disturbance, but the news reached hunters and numbers stabilised at around several dozen. Key to the preservation of the species in the region is much greater public awareness along with the creation of federal protected areas. In particular, a unique opportunity exists to create a 300 000-ha transboundary steppe sanctuary, the Kurumbel'skii nature reserve, in the south-east of Omsk oblast' (Cherlaksii and Okoneshnikovskii districts), adjacent Novosibirsk oblast' (Chistoozornyi district) and Pavlodar province in Kazakhstan (Zhelezinskii district).

HISTORICAL STATUS IN WESTERN SIBERIA AND NORTHERN KAZAKHSTAN

The area under study here, comprising the south of western Siberia and adjacent parts of northern Kazakhstan, is an enormous tract of largely open landscapes around 1650 km from west to east and 1250 km from north to south, comprising seven political administrative divisions, five in Russia (Kurgan, Tyumen', Omsk and Novosibirsk oblast's and Altai krai) and two in Kazakhstan (North Kazakhstan and Pavlodar provinces; Figure 1). Until the mid-19th century, the Great Bustard *Otis tarda tarda* and Little Bustard *Tetrax tetrax* were abundant species in the region, the former inhabiting vast forest-steppe and steppe areas. Even the Asian Houbara *Chlamydotis macqueenii* was recorded in the northern and southern districts of modern-day Omsk oblast' by authors writing in the 19th and early 20th centuries (Pallas 1786, Levshin 1832, Atkinson *et al* 1865, Krasovskii 1868, Slovtsov 1881, 1897, Finsh & Brem [*sic*] 1882, Stepanov 1886, Sotnikov 1892, Ruzskii 1897, Morozov 1898, Plotnikov 1898, Dmitriev-Mamonov & Zdzysarskii 1900, Yel'pat'evskii 1901, Sedel'nikov & Borodin 1903, Sedel'nikov 1907, Ioganzen 1907). Great Bustards were even reported as being kept in captivity by local people (Krasovskii 1868).

Tyumen' oblast'.—There is no information available on the species' occupancy of the south of Tyumen' oblast', although what were probably vagrant birds have occurred in the area. In September 1960, game manager G Sedel'nikov hunted an adult individual flying across a road near lake Marukha in Abatskii district (Azarov 1996).

Omsk oblast'.—In western Siberia in the 19th century the Great Bustard nested as far north as Omsk (54° 58' N, 73° 22' E; Stepanov 1886, Morozov 1898, Slovtsov 1897). Later, however, the species was 'observed rarely and not closer than 60–70 versts [65–75 km] from Omsk' (Lavrov 1925). Ruzskii (1897) referred to the Great Bustard as a common species around Krestiki village and the nearby lake Chebakly and Golodnaya steppe. According

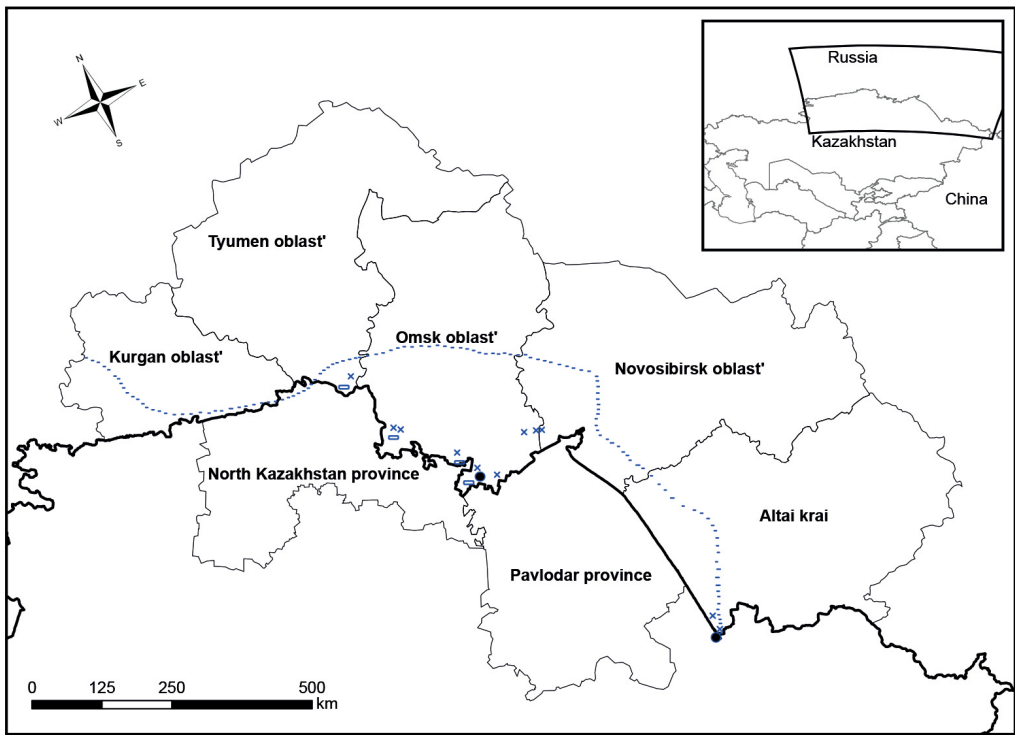


Figure 1. Distribution of Great Bustard in western Siberia and northern Kazakhstan. Dotted line represents the northern boundary of Great Bustard distribution by the middle of the 20th century. The following marks represent recent observations: black filled circles represent observations during the winter period; rectangles represent observations in autumn; X represents observations during the breeding period.

to old-time local hunters and naturalists, in the 1930s–1940s large populations of the Great Bustard lived in the south of Omsk oblast', in particular, in Russko-Polyanskii district between the villages of Novo-Sanzharovka, Bessarabka and Khlebodarovka and the areas known as Sumurza and Beliki. These populations used to make short-distance migrations southwards, to the Kazakh steppes, as the food in their breeding habitats became inaccessible due to weather conditions. However, when plenty of forage was available during low-snow winters, Great Bustards remained in this region. They could be observed on the slopes of snow-topped ravines, where, under thickets of bushes and weeds, niches remained clear of snow, which were used by these birds for shelter in windy and frosty weather (Nefedov 2004, 2005, 2007b). In the late 1950s (1954–1959) local hunters repeatedly observed Great Bustards on the Irtysh floodplain near Kitaily village north of Omsk (55° 15' N) after the autumn hunting season was opened in mid-August, and shot one from a group of 5–7 in late August or early September 1957 (Nefedov 2002, 2007b). Salin (1960) was the last author to mention the Great Bustard as a species inhabiting Omsk oblast'.

Novosibirsk oblast'.—The species occupied the south of the Barabinsk depression (Kashchenko 1898) and Tobol-Ishim plain (Ruzskii 1897, Slovtsov 1897) and the north of the Kulundinskaya plain (Ioganzen 1907). It nested in Novosibirsk oblast' to 54° N, near lake Chany in Barabe (Buturlin 1935).

Altai krai.—Formerly, to the north-east, the Great Bustard ranged approximately to a point between Barnaul and Kemerovo, in the south-west outskirts of Leninsk-Kuznetskii (54° 28' N, 86° 06' E; Cherkasov 1884). There are 19th-century reports of birds overwintering in the Altai: '...great bustards, partridges and quails winter on sunlit and snowless

mountain slopes in the northern extremities of Altai (just below 53° N)' (Middendorf 1877). An old record, presumably of the Great Bustard's western subspecies, occurred just east of our area between the present-day towns of Gurevsk and Leninsk-Kuznetskii, Kemerovo oblast' (54° 23' N, 86° 03' E; Cherkasov 1884). Near Zmeinogorsk, by 1928 the species was already 'very rarely encountered in the gently rolling steppes of the Aleisko-Loktevskaya rise, displaced everywhere by humankind' (Selevin 2003).

Altai republic.—The species was noted in the north-east Altai near the Andaba mine, near 52° 20' 00" N, 88° 07' 36" E (Kashchenko 1899).

Kazakhstan.—The Great Bustard was regarded as a typical bird of the north of Akmolinsk oblast', which at that time partially incorporated some territories of the northern oblast's of Kazakhstan and southern Siberia, including the southern and central territories of modern-day Omsk oblast' (Anon. 1908, 1911). For the same oblast' Sedel'nikov (1916) listed it as an 'important bird'. At the end of the 19th century, the Great Bustard bred 10 versts [10 km] from Petropavl (Petropavlovsk), but after construction of the railway, not closer than 30–40 versts (Grachev & Berezovikov 2005). With the reclamation of virgin steppe, the Great Bustard completely disappeared from the region between the Ubagan and Ishim rivers, and in recent years even vagrant individuals were not reported from the area surrounding the villages of Presnovka, Blagoveshchenka, Tselinnyi and Timuryazevo (south of the border with Chelyabinsk). The last reliable observation was of two Great Bustards south of Petropavl in the summer of 1969, at Gorodetskoe village in Sergeevskii district (Grachev & Berezovikov 2005). Borisenko (2003) encountered the species twice in Kostanai oblast' in 1963 but in the two summers (May–August) of 1971 and 1972 he drove 4500 km through Kostanai, North Kazakhstan, Kokshetau and Tselinograd oblast's without seeing any Great Bustards or Little Bustards; he concluded that by 1977 'the Little Bustard and Great Bustard had practically disappeared from farmed lands in steppe regions' and only then survived in the semi-desert and desert areas, the Little well in a few places, the Great extremely rare everywhere' (Borisenko 2003). In North Kazakhstan oblast', the Great Bustard survived into the late 1960s, with vagrants recorded in the south in the 1990s, thus overall 'an extremely rare vagrant species' (Vilkov & Drobvtsev 1999, Vilkov 2010). Observations of birds in the Irtysh river area in Pavlodar province (150 km south of Pavlodar and 40–50 km west of the Irtysh) made in August, September and early October 1958 are mentioned in a 1960 report (*vide* Ivliev *et al* 2012).

RECENT STATUS IN WESTERN SIBERIA AND NORTHERN KAZAKHSTAN

As we have seen, numbers of Great Bustards in our region began decreasing in the late 19th–early 20th century, sharply dropped in the 1950s, and after the early 1960s almost entirely disappeared. Nowadays, except in Omsk oblast' the Great Bustard is not regularly recorded in western Siberia (Kurgan, Tyumen' and Novosibirsk oblast's and Altai krai) and northern Kazakhstan (North Kazakhstan and Pavlodar provinces). In the 21st century the only records outside Omsk oblast' in the Russian part of our region are from Tyumen' oblast': 4–5 birds (a family?) near the village of Blagodatnoe in Kazanskii district in early October 2005 (Tarasov *et al* 2007), and a bird later identified by the observer, V Gulyaev, from a field guide, in mid-May 2001, performing a distraction (injury) display in a portion of a field which was reverting to steppe vegetation near lake Gorkoe, 18 km south of Ishim town (Tarasov & Primak 2013). However, birdwatchers from the popular citizen data websites Birds of Kazakhstan (<http://birds.kz>) and Birds of Siberia (<http://sibirds.ru>), which began to operate in 2012, have not recorded Great Bustards in these localities.

According to Ryabitsev (2001, 2008, 2014), the Great Bustard's range does not overlap Omsk oblast'. Nevertheless, in annual publications he edited there are two published reports of Great Bustards in the oblast', including a pair of Great Bustards and a vagrant

Asian Houbara (Nefedov 2001b, 2012). These were reported again in other publications (Nefedov 2001a, 2002, 2003, 2005, 2007b, 2013a,b, Nefedov & Sidorov 2005, Sidorov & Rusakov 2005). More concretely, on 16 May 2000, together with VS Kryuchkov (senior researcher at the Western Siberian Department of the All-Russia Hunting Research Institute), I observed 2 Great Bustards in the Stepnoi federal hunting reserve (54° 15' N, 75° 30' E), 1.5 km north-east of lake Porshnevo, Cherlaxskii district, Omsk oblast', near the border with Novosibirsk oblast'. This was the first record of the species since the 1960s (Nefedov 2001b). After that, the Great Bustard was given the status of a very rare species in Omsk oblast', with single records of vagrant individuals requiring confirmation (Ryabitsev *et al* 2001). In August 2001, VA Novikov, leading specialist at the oblast's State Committee for Nature Conservation (*Goskompriroda*), recorded a female with two fledglings the size of adult chickens in Pavlogradskii district. I estimated that 1–2 pairs nested in the oblast' in 2000 and 4–5 pairs in 2002, when the entire population was, probably, not larger than 15 individuals (Nefedov 2002). The species' range was expanding, and by 2003 the bird was recorded in Okoneshnikovskii, Cherlaxskii, Pavlogradskii, Novovarshevskii and Russko-Polyanskii districts. In 2004 5–7 pairs nested in the oblast', while the total number in the beginning of the breeding season was, probably, 20–25 individuals (Nefedov 2005, 2007b). In Russko-Polyanskii district local farmers repeatedly encountered 1–3 individuals and recorded 10 in total. All records were incidental (Nefedov 2007b). Probably, the species was also increasing in adjacent areas in Kazakhstan and Novosibirsk oblast', where the grazing of livestock and cultivation of former steppe had almost entirely ceased.

According to AN Skripkarev (verbally), a pair of Great Bustards was observed in the Stepnoi hunting reserve near Leninsk (54° 34' N, 75° 32' E) in Okoneshnikovskii district in May 2006. Leninsk is only 15 km north-west of my record of the species in May 2000. This area requires more study. Up until the early 20th century, the Great Bustard was common there, but disappeared by about the middle of the century. PM Artamonov (verbally), a ranger at the Stepnoi hunting reserve, did not record the species in his journal between 1961 and 1987. VV Mitin (verbally) saw a small individual—a female or youngster—on 15–17 September 2009, 1 km south of Lezhanka, Gorkovskii district. GG Andreev, head of the Omsk Department of the Russian Federal Service for Veterinary and Phytosanitary Supervision (*Rosselkhoz nadzor*), made several records of single birds in the fields of the former Tselinnyi state farm in Russko-Polyanskii district in May–June 2008 (Nefedov 2012, 2013a). Unfortunately, the Stepnoi hunting reserve was liquidated in 2015 by a resolution issued by the Russian government following a proposal from the executive bodies of Omsk oblast'. That was the only protected area with steppe landscapes in western Siberia where the Great Bustard had been repeatedly recorded since the early 2000s.

Sidorov & Plikina (2015) contains two questionable records of the Great Bustard. First, game manager VV Klevno reportedly witnessed a bird being shot above Valerinskoe (Kaban'e) lake (55° 03' N, 74° 51' E) in Kalachinskii district in 1991, but upon reassessing the information, Klevno (verbally) denied this. Alongside this, a local hunter, now deceased, told him in a personal conversation that he saw one in Kalachinskii district near Osokino village (central forest-steppe) in the 2000s. The second error in Sidorov & Plikina (2015) concerns VA Lebedev, who was reported to have observed a female with a brood at an unnamed marsh in July 2003 in Isil'kul'skii district. But district game manager AF Kalashnikov, a close friend of the now-deceased hunter Lebedev, absolutely refutes this record, saying that if it had occurred, he would have known.

However, the information given by game manager VI Ivko of the Hunters' Association of Omsk oblast' (*Oblokhotoschestvo*) deserves special attention. Ivko reports 'numerous' records of the Great Bustard in Isil'kul'skii district, south of the town of Isil'kul', mainly near the border with Poltavskii district, in spring and autumn between 2007 and 2013. He

made four records himself and received 'regular' reports of 1–3 adult individuals from agricultural machine operators, farmers and other residents. In summer 2012 he came across a brood of four (!) young the size of Woodpigeons *Columba palumbus*. He estimated that by 2012 Isil'kul'skii district held 50–60 Great Bustards. The numbers dropped sharply after 2013, and no records of the species were made in the district between 2014 and 2017. There were, probably, up to 100 Great Bustards in Omsk oblast' in 2012, but only some 20 in 2017. The reasons for the sudden growth of the population in 2007–2012 and the equally sudden decrease after 2013, at the northern extremity of the species' range, are unclear.

After 2005, as the news about the Great Bustard's reappearance in Omsk oblast' leaked out, poaching led to a halt in the growth of the species' population there (excluding Ivko's report above about Isil'kul'skii district). By 2010, numbers had decreased everywhere, stabilising at several dozen individuals.

MAIN LIMITING FACTORS

Currently, the Great Bustard is very rare not only in Omsk oblast', but also throughout western Siberia and northern Kazakhstan. The main reasons for this circumstance are largely the same everywhere in the region. In the 19th through 20th centuries they included the following: conversion of land for agricultural purposes; use of pesticides; livestock herding and stray dogs; overgrazing; depredation of nests by corvids (whose populations expanded greatly in the 1950s and 1960s with the plowing of steppe and planting of trees); high levels of disturbance by humans; illegal hunting; electric powerlines; haymaking; and fires set for agricultural purposes. In the 21st century the main limiting factors remained the same, and only their relative impacts have changed. In descending order of impact they are: active illegal hunting of wintering birds; high levels of human disturbance; livestock herding and stray dogs; depredation of nests by corvids; burning for agricultural purposes; powerlines; and haymaking.

The growing numbers of the Great Bustard in the early 2000s were associated with the expansion of areas suitable for nesting. In the late 1990s, the sharp shrinkage of cultivated agricultural areas and decrease in livestock populations, expansion of fallow lands, almost complete cessation of pesticide use and reduction of human disturbance combined to have a positive impact on the Great Bustard population.

CONSERVATION MEASURES TAKEN

The Great Bustard is listed in the *Red Data Book of Russia* (Danilov-Danil'yan 2001) as a category 3 species and in the *Red Data Book of Omsk Oblast'* (Sidorov & Plikina 2015) as category 4 (with insufficient data available on the current status in the wild). The species' status in some neighbouring administrative units of the Russian Federation is: Altai krai – category 1 (Bondarenko 2017); Novosibirsk oblast' – category 0 (probably extinct; Glupov & Shaulo 2018); and Tyumen' oblast' – category 0 (probably extinct; Bol'shakov 2004). The Great Bustard is not included in the *Red Data Book of Kurgan Oblast'* (Bol'shakov 2012).

RECOMMENDATIONS

The Great Bustard's micropopulations in western Siberia and northern Kazakhstan are migratory and therefore more sensitive to various negative impacts in different countries and regions. International cooperation all along the migration routes and across wintering grounds is essential to protect the species. In addition, for Asian countries it is necessary to maintain close cooperation with the European regions of Russia inhabited by neighbouring populations. It is clear that without governmental support it will be impossible to take successful conservation steps. It is also evident that priority interventions may vary across the regions. But wildlife conservation is beneficial to all, and the greater the number



Figure 2. Map of the area in Omsk and Novosibirsk oblast's of Russia and Pavlodar province of Kazakhstan for possible inclusion in the Kurumbel'skii state steppe nature reserve. Scale – 1:200 000. Green line – outer boundary of possible nature reserve; dark red line – state border between Kazakhstan and Russia; orange crosses – sites which hosted large numbers of bustards at the end of the 19th and early 20th centuries, and where the species has also been observed in the 21st century.

of stakeholders involved the sooner the problems associated with the Great Bustard's conservation and breeding will be solved. Of cardinal importance are measures to raise the awareness of local people and to involve them in the conservation of the Great Bustard, with broad coverage by the press.

The basic and most efficient step to protect the Great Bustard is the conservation of their natural habitats, for which purpose protected areas, primarily nature reserves, should be created at a federal level. Therefore, the priority and pressing task is to establish an international steppe reserve in the south-east of Omsk oblast' (Cherlaksii and Okoneshnikovskii districts), with the partial inclusion of adjacent districts in Novosibirsk oblast' (Chistoozyorni district) and Pavlodar province in Kazakhstan (Zhelezinskii district; Nefedov 2002, 2004, 2005, 2007a,b, 2008, 2010, 2011a, 2013a,b). In general, the areas proposed for inclusion in the nature reserve are the least impacted by agricultural activity; most (80%) of the territory has never been tilled. In the adjacent territories in Novosibirsk oblast' and Pavlodar province of Kazakhstan, the proportion of cultivated lands is even lower. The ecosystems of former pastures and hayfields, which occupy two-thirds of the proposed nature reserve, are re-establishing themselves (Nefedov 2007c). The organisation of the Kurumbel'skii nature reserve (Figure 2) on an area of 300 000 ha is itself expected to start natural processes of restoring steppe ecosystems and their components, including the Great Bustard and Little Bustard. There is also potential for the Asian Houbara to use the area for regular breeding. For that purpose, field research has been carried out and necessary legal documents obtained. Strict protection of the unique virgin steppe ecosystems would also be commercially beneficial to local communities. The inclusion in the Kurumbel'skii nature reserve of the buffer zones along the state border between Russia and Kazakhstan, which are controlled by border troops, would facilitate the creation and

protection of the transboundary nature reserve. This would also allow for a larger core zone and facilitate international cooperation to create natural populations of bustards and large steppe ungulates and protect them along their migration routes.

Table 1. Current population estimate for number of Great Bustards in each region in this study: Omsk, Tyumen', Kurgan, and Novosibirsk oblast's and Altai krai of Russian Federation, and adjacent North Kazakhstan and Pavlodar provinces of Kazakhstan. These numbers are an expert evaluation of the number of individual birds appearing in the region in each season, with data available in May 2017. Estimate of the number of sites is based on the total number of locations in which the birds were observed from 2010–2017.

Geographic region	Season	Number of Great Bustards	Number of sites	Quality of estimate (from 1–5) ⁴
Tyumen' oblast', Russia ¹	Breeding	2–6	1	2
	Gathering for migration	3–15	1	2
	Wintering	–	–	–
Kurgan oblast', Russia ¹	Breeding	2–6	–	1
	Gathering for migration	3–15	–	1
	Wintering	–	–	–
Omsk oblast', Russia ²	Breeding	10–20	25	3
	Gathering for migration	9–25	3	2
	Wintering	–	– ³	1
Novosibirsk oblast', Russia ¹	Breeding	2–6	1	1
	Gathering for migration	3–15	–	1
	Wintering	–	–	1
Altai krai, Russia ¹	Breeding	10–20	3	2
	Gathering for migration	9–35	–	2
	Wintering	–	– ³	1
North Kazakhstan province, Kazakhstan ¹	Breeding	4–10	1	2
	Gathering for migration	9–35	–	1
	Wintering	–	– ³	1
Pavlodar province, Kazakhstan ¹	Breeding	4–10	–	1
	Gathering for migration	9–35	1	1
	Wintering	–	– ³	1
Total for these regions of western Siberia	Breeding	34–78	31	2
	Gathering for migration	Sum not applicable	4	1
	Wintering	–	–	1

¹ In these regions nesting and migratory gatherings of Great Bustard have not been well researched.

² In Omsk oblast' I have registered the maximum number of places that may represent potential breeding sites (25) and migratory gathering sites (3). These include two sites where broods were encountered. The data available indicate that nesting sites are not constant between years. An exception is presented by two large territories that are known to host this bird regularly in the nesting season: the regional (until 2015, federal) Stepnoi nature reserve and the southern half of Isil'kul'skii district.

³ Regions with *potential* for overwintering Great Bustards in western Siberia (Omsk oblast', Novosibirsk oblast', Altai krai, North Kazakhstan and Pavlodar provinces). In the past, Great Bustards were observed overwintering in the south of Omsk oblast' (Nefedov 2005). Conditions for overwintering in the other four marked regions are superior to those in Omsk, as they are located further to the south.

⁴ Quality of estimate, from 1 (low-quality) to 5 (high-quality)

One of the most important objectives of the Kurumbel'skii nature reserve will be to establish a station to study the ecology of the Great Bustard (alongside other steppe animal species) and develop methods to hatch and release them into the wild in the south of Omsk oblast' and adjacent territories. The most notable nursery for the protection of the Great Bustard in Russia is that managed by the Institute of Ecology and Evolution, Russian Academy of Sciences, in Saratov oblast'. The Karasuk research station under the Institute of Systematics and Ecology of Animals, Siberian Branch of the Russian Academy of Sciences, located in neighbouring Novosibirsk oblast', has also acquired some experience in caring for bustards. Such a nursery in Omsk can be organised only on the basis of a protected area with a federal status, for which both suitable environment and regulatory framework are still available.

Apart from the Kurumbel'skii nature reserve, a network of federal protected areas is needed along migration routes and on wintering grounds in Kazakhstan and other countries. Such a network should also be created in the south of western Siberia and northern Kazakhstan to breed the Great Bustard. Steppe areas of special value can be protected only within cluster-type reserves with a federal status. A cluster reserve must cover, for instance, all the districts in Omsk oblast' (Isil'kul'skii, Novovarshavskii, Odesskii, Okoneshnikovskii, Pavlogradskii, Poltavskii, Russko-Polyanskii, Cherlaksii and Sherbakulskii) where the Great Bustard is recorded. Reserves like this are also necessary in other parts of the region, where the Great Bustard occurs in spring and summer.

Adopting a federal program by the Ministry of Natural Resources and Environment would be of great importance for the restoration of bustards. The program should cover all related issues, from controlling corvid populations to international cooperation. Alas, however, for over 20 years Omsk officials have avoided meeting laws prescribing the establishment of the Kurumbel'skii nature reserve. Yet for over 20 years hundreds of thousands of hectares in the Kurumbel'skii steppe have not been used even as pastures or hayfields. In the meanwhile, these lands offer the most suitable environment within Russia to establish and maintain a viable population of the Great Bustard. The area is also large enough to support natural populations of wild ungulates. To lose another chance to establish a reserve in Russia's largest and most unique surviving steppe area would be, to say the least, irresponsible.

LITERATURE CITED

- Anon. 1908. [Review of *Akmola Oblast' in 1907*.] Publishing House of the Akmola Oblast' Administration, Omsk. [In Russian]
- Anon. 1911. [Review of *Akmola Oblast' in 1910*.] Publishing House of the Akmola Oblast' Administration, Omsk. [In Russian]
- Atkinson, TU. 1865. [Travel in Asiatic Russia and Kyrgyz steppes.] In: Etzel', A & G Vagner (eds). *Travel in the Steppes and Mountains of Siberia and Adjacent Lands in Middle Asia*. MO Vol'f Typography, Saint Petersburg, pp151–518. [In Russian]
- Azarov, VI. 1996. [Rare Animals of Tyumen' Oblast' and their Conservation.] Vektor Buk, Tyumen'. [In Russian]
- Bol'shakov, VN (exec ed). 2012. [Red Book of Kurgan Oblast'. 2nd edition.] Kurgan State University Press, Kurgan. [In Russian]
- Bol'shakov, VN (chair ed board). 2004. [Red Book of Tyumen' Oblast'. Animals, Plants and Fungi.] Urals University Press, Ekaterinburg. [In Russian]
- Bondarenko, AV (ed-in-chief). 2017. [Red Book of the Altai Republic. Animals. 3rd edition.] Gorno-Altaiisk Typography, Gorno-Altaiisk. [In Russian]
- Borisenko, VA. 2003. [On the numbers of the Demoiselle Crane *Anthropoides virgo*, Little Bustard *Otis tetrax*, Great Bustard *Otis tarda* and Houbara Bustard *Chlamydotis undulata* in some regions of Kazakhstan.] *Russian Journal of Ornithology* 12 (express-issue 224): 609–611. [In Russian]
- Buturlin, SA. 1935. *Complete Guide to Birds of the USSR*. Vol 2. Loons, Pelicans, Herons, Waterfowl, Galliforms, Rails, Hemipodes. KOIZ, Moscow.
- Cherkasov, AA. 1884. [Notes of an Eastern Siberia Hunter.] AS Suvorin Press, St Petersburg. [In Russian]

- Danilov-Danil'yan, VI. (chair ed board). 2001. [*Red Book of the Russian Federation.*] Astrel', Moscow. [In Russian]
- Dmitriev-Mamonov, AI & AF Zdzysarskii. 1900. [*A Guide to the Great Trans-Siberian Railway.*] Partnership of the Artistic Press, Saint Petersburg. [In Russian]
- Finsh, O & A Brem. 1882. [*The Journey of Doctor O Finsh and A Brem to Western Siberia*] [spellings of surnames as in Russian]. MN Lavrov Typography, Moscow. [In Russian]
- Glupov, VV & DN Shaulo (eds-in-chief). 2018. [*Red Book of Novosibirsk Oblast'. 3rd Edition. Animals, Plants and Fungi.*] Arta, Novosibirsk. [In Russian]
- Grachev, VA & NN Berezovikov. 2005. [Materials on the avifauna of the area between the Ubagan and Ishim rivers (northern Kazakhstan).] *Russian Journal of Ornithology* 14 (express-issue 294): 651–676. [In Russian]
- Ioganzen, GE. 1907. [Materials on the avifauna of the steppes of Tomsk krai.] *News of the Imperial Tomsk University* 30: 1–239. [In Russian]
- Ivliev, VG, OV Mitropol'skii & MG Tazetdinov. 2012. [On the avifauna of virgin lands under development (Irtys' area near Pavlodar).] *Russian Journal of Ornithology* 21 (express-issue 294): 174–178. [In Russian]
- Krasovskii, M. 1868. [*Materials on the Geography and Statistics of Russia compiled by the Officers of the General Staff. Siberian Kyrgyz Region. Part I.*] Transhel', Retger & Shneider Typographies, Saint Petersburg. [In Russian]
- Lavrov, S. 1925. [Birds found in the vicinity of Omsk and their economic value.] *Works of the Siberian Agricultural Academy* 4: 1–20. [In Russian]
- Levshin, A. 1832. [*Descriptions of the Kyrgyz-Kaisak Hordes and Steppes. Part One: Geographical Information.*] Karl Krai Typography, Saint Petersburg. [In Russian]
- Middendorf, AF. 1877. [*Trip to the North and East of Siberia.*] Imperial Academy of Science, Saint Petersburg. [In Russian]
- Morozov, A. 1898. [List of birds in Akmola oblast' and adjacent areas in Tobol'sk and Tomsk provinces.] *Notes of the Western Siberian Department of the Imperial Russian Geographical Society* XXIV: I–IV, 1–17. [In Russian]
- Nefedov, AA. 2001a. [Strictly protected areas. Section IV.] In: Faikov, AA & SA Kostyrev (eds). *The Condition and Protection of the Environment in Omsk Oblast' in 2000*. Annual Report of the State Committee on Environmental Protection of Omsk Oblast', Omsk, ppIV–1–IV–18. [In Russian]
- Nefedov, AA. 2001b. [Great Bustard in Omsk oblast'.] In: Ryabitsev, VK (ed). *Materials on the Distribution of Birds in the Urals, the Cis-Urals and Western Siberia* 6: 129. [In Russian]
- Nefedov, AA. 2002. [Action Plan to Conserve the Great Bustard *Otis tarda tarda* in Omsk Oblast'.] State Committee on Environmental Protection of Omsk Oblast', Omsk. [In Russian]
- Nefedov, AA. 2003. [Nature reserves. Part IV.] In: Yalovenko, NN (ed). *Strictly Protected Areas. Condition and Protection of the Environment in Omsk Oblast' in 2002*. State Committee on Environmental Protection of Omsk oblast', Omsk, ppIV–2–IV–11. [In Russian]
- Nefedov, AA. 2004. [Nature reserves. Part IV.] In: Yalovenko, NN (ed). *Strictly Protected Areas. Condition and Protection of the Environment in Omsk Oblast' in 2003*. Main Department for Natural Resources and Environmental Protection in Omsk Oblast', Ministry of Natural Resources of the Russian Federation, Omsk, pp161–162. [In Russian]
- Nefedov, AA. 2005. [Priority measures to organise protected areas to conserve rare plant and animal species in Omsk oblast'.] In: Stankovskii, AP, LV Martynova & GV Sitnikova (eds). *Protected Areas of the Omsk Region. Proceedings of the Regional Scientific and Practical Conference*. Society for the Protection of Siberia, Omsk, pp72–77. [In Russian]
- Nefedov, AA. 2007a. [Explanatory note. Territorial planning regulations. Territorial planning scheme for Omsk Oblast'.] In: *Strictly Protected Areas. Volume 1*. Leningprogor, Saint Petersburg, pp184–186. [In Russian]
- Nefedov, AA. 2007b. [Rare birds of Omsk oblast'.] In: Kassal, BYu (ed). *Works of the Zoological Commission of the Omsk Regional Department of the Russian Geographical Society*. OPO RGO, Omsk, pp33–53. [In Russian]
- Nefedov, AA. 2007c. [A steppe nature reserve is needed in western Siberia.] *Steppe Bulletin* 23-24: 41–43. [In Russian]
- Nefedov, AA. 2008. [State nature reserve 'Stepnoi' (the other proposed name – 'Kurumbel'skiiskaya steppe').] In: *Schematic Layout for Territorial Planning in Omsk Oblast'*. Leningprogor, Saint Petersburg, pp24–25. [In Russian]
- Nefedov, AA. 2010. [Bobak Marmot in Omsk oblast'.] *Omsk School of Biology Interuniversity Collection of Research Works* 7: 96–104. [In Russian]
- Nefedov, AA. 2011a. [Distribution of the Marmot in Omsk oblast'.] In: *Theriofauna of Russia and Adjacent Areas*. 9th Meeting of the Theriological Society under the Russian Academy of Sciences (1–4 February 2011). KMK Scientific Press, Moscow, p326. [In Russian]
- Nefedov, AA. 2011b. [On the Red Data Book of Omsk oblast'.] *Omsk School of Biology Interuniversity Collection of Research Works* 8: 140–161. [In Russian]

- Nefedov, AA. 2012. [On the rare birds of Omsk oblast'.] In: Ryabitsev, VK (ed). *Materials on the Distribution of Birds in the Urals, the Cis-Urals and Western Siberia* 17: 121–134. [In Russian]
- Nefedov, AA. 2013a. [Bustards in Omsk oblast'.] *Steppe Bulletin* 38: 44–47. [In Russian]
- Nefedov, AA. 2013b. [What kind of reserve would the Kurumbel'skii steppe be?] *Steppe Bulletin* 39: 36–43. [In Russian]
- Nefedov, AA & GN Sidorov. 2005. [Omsk oblast' needs a nature reserve.] In: Stankovskii, AP, LV Martynova & GV Sitnikova (eds). *Protected Areas of the Omsk Region. Proceedings of the Regional Scientific and Practical Conference*. Society for the Protection of Siberia, Omsk, pp90–95. [In Russian]
- Pallas, PS. 1786. [Travel in Different Parts of the Russian State. Part Two. Book Two. With appendices 'Addition to the second part', 'Description of animals and plants'.] Imperial Academy of Sciences, Saint Petersburg. [In Russian]
- Plotnikov, VN. 1898. [Ornithological sketch of the Yamyshevskii village area.] *Notes of the Western Siberian Department of the Imperial Russian Geographical Society* XXIV: I–II, 1–23. [In Russian]
- Ruzskii, M. 1897. [Brief faunistic sketch of the southern strip of Tobol'sk province (report to the Governor of Tobol'sk about zoological studies made in 1896).] *Yearbook of the Tobol'sk Provincial Museum* VII: 37–82. [In Russian]
- Ryabitsev, VK. 2001. [Handbook. Birds of the Urals, Cis-Urals and Western Siberia.] Urals University Press, Yekaterinburg. [In Russian]
- Ryabitsev, VK. 2008. [Handbook. Birds of the Urals, Cis-Urals and Western Siberia. 3rd edition, revised and corrected.] Urals University Press, Yekaterinburg. [In Russian]
- Ryabitsev, VK. 2014. [Birds of Siberia. Vol 2.] Armchair Scientist, Moscow & Yekaterinburg. [In Russian]
- Ryabitsev, VK, GV Boyko, SS Moskvitin, AA Vasil'chenko, TN Gagina, SN Gashev, VD Zakharov, NL Irisova, VA Korovin, OB Mitrofanov, VYu Petrov, SA Solovyov, YeG Strel'nikov, VV Tarasov, SM Tsybulin & VV Yakimenko. 2001. [Avifauna of the regions of western Siberia.] *Inventory, Monitoring and Protection of Important Bird Areas in Russia* 3: 140–168. [In Russian]
- Salin, Yu. 1960. [The game fauna is becoming richer.] *Hunting and Game Management* 12: 15. [In Russian]
- Sedel'nikov, AN. 1907. [Chapter III. Plants and animals. Siberia.] In: Semenov-Tyan'-Shanskii, PP (ed). *Complete Geographical Description of Our Fatherland. Vol. XVI*. AF Devrien Press, Saint Petersburg, pp99–147. [In Russian]
- Sedel'nikov, AN. 1916. [Akmola Oblast'. Textbook on the Study of the Motherland for Schools of the Western Siberian Educational Region.] Publishing House of the Omsk Military Region, Omsk. [In Russian]
- Sedel'nikov, AN & NA Borodin. 1903. [Chapter III. Plants and animals. The Kyrgyz region. Russia.] In: Semenov, PP (ed). *Complete Geographical Description of Our Fatherland. Vol XVIII*. AF Devrien Press, Saint Petersburg, pp82–137. [In Russian]
- Selevin, VA. 2003. On the birds of the Zmeinogorsk area. *Russian Journal of Ornithology* Express-issue 210: 97–100. [In Russian]
- Sidorov, GN & VN Rusakov (eds). 2005. [Red Book of Omsk Oblast'.] Publishing House of OmGPU, Omsk. [In Russian]
- Sidorov, GN & NV Plikina (eds). 2015. [Red Data Book of Omsk Oblast'. 2nd edition.] Publishing House of OmGPU, Omsk. [In Russian]
- Slovtsov, I. 1881. [Travel notes made during a trip to Kokchetav district, Akmola oblast', in 1878.] *Notes of the Western Siberian Department of the Imperial Russian Geographical Society* III: 1–152. [In Russian]
- Slovtsov, IYa. 1897. [Travel notes made during I Slovtsov's trip to Kokchetav district, Akmola oblast', in 1878.] 2nd edition. *Notes of the Western Siberian Department of the Imperial Russian Geographical Society* XXI: 1–198. [In Russian]
- Sotnikov, P. 1892. [Brief ornithological sketch of the vicinity of Omsk (1877–1892).] *Nature and Hunting* XIII: 28–57. [In Russian]
- Stepanov, PV. 1886. [Travel notes made during a trip, in summer 1885, to the upper reaches of the Tartas and Tara rivers and zoographic sketch of the forest and wetland zone lying between the Om', Tara and Irtysh rivers (with a map).] *Notes of the Western Siberian Department of the Imperial Russian Geographical Society* VIII, Edition II: 1–38. [In Russian]
- Tarasov, VV & IV Primak. 2013. [On the condition of unprotected bird species in Tyumen' oblast'.] In: Gashev, SN (ed). *Materials for the Second Edition of the Red Data Book of Tyumen' Oblast'*. TyumenNIlgiprogaz, Tyumen, pp125–144. [In Russian]
- Tarasov, VV, VK Ryabitsev, IV Primak & AYU Davydov. 2007. [Birds of Kazanskii district of Tyumen' oblast'.] *Materials on the Distribution of Birds in the Urals, the Cis-Urals and Western Siberia* 12: 238–258. [In Russian]
- Vilkov, VS. 2010. The avifauna of North Kazakhstan oblast'. *Russian Journal of Ornithology* 19 (express-issue 574): 947–967. [In Russian]
- Vilkov, VS & VI Drobovtsev. 1999. [Bustards and Galliformes in North Kazakhstan oblast'.] *Materials on the Distribution of Birds in the Urals, the Cis-Urals and Western Siberia* 4: 71–72. [In Russian]

Yelpat'evskii, VS. 1901. [Appendix IV. List of Amphibia, Reptilia, Aves and Mammalia collected in 1898 in Omsk county. The saltwater lakes of Selety-Dengiz, Teke and Kyzyl-Kak in Omsk county. A physiographical sketch by L Berg and P Ignatov.] *Notes of the Western Siberian Department of the Imperial Russian Geographical Society* XXVIII: 130–154. [In Russian]

*Aleksandr Alekseevich Nefedov, Omsk Branch of the Russian Geographic Society, 3 Museum Street, Omsk 644099, Russia.
anefyodov2007@mail.ru*