Challenges and opportunities for the conservation of large but fluctuating flocks of Little Bustards *Tetrax tetrax* in eastern Georgia

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Summary: Four winter surveys in 2020–2024 found that large but fluctuating numbers of Little Bustards *Tetrax tetrax* use eastern Georgia, notably Dedoplistskaro municipality, as an important wintering area, with flocks often crossing from Azerbaijan. However, habitat loss due to expanding olive and almond plantations, along with overgrazing, has led to fragmentation and increased vulnerability to poaching outside protected areas. Recent conservation initiatives, such as the establishment of the Nugzar Zazanashvili Samukhi Multipurpose Use Protected Area and pastureland restoration by the Society for Nature Conservation (SABUKO), contribute to the formal protection of key wintering habitats to secure the species' long-term survival, but more is needed to prevent the ongoing fragmentation and degradation of the area's steppe and traditional farmland.

INTRODUCTION

The German naturalist Gustav Radde (1884) noted that Little Bustards *Tetrax tetrax* were a common sight in winter in Azerbaijan and the environs of Tbilisi in Georgia. He recorded that, when the weather was too harsh in the species' main wintering areas around Lankaran and the Mughan plain in Azerbaijan, flocks moved into Georgia. He added that Little Bustards were then a very common game bird sold in the public markets of old Tbilisi. Little is known about the numbers of wintering birds in the two countries in the nineteenth century, but according to Satunin (1907) the number of wintering birds was strongly dependent on the weather, and there were bigger flocks if the winter was harsh. That still seems to be the case, as we show below.

Vereshchagin (1940) also mentioned transboundary wintering sites of Little Bustards in Georgia which coincide with modern wintering areas (Figure 1). Likewise, Markov (1955) reported that Little Bustards used to visit the warmer parts of Georgia to overwinter, mentioning a population in the coastal areas of the Black Sea in western Georgia, albeit in smaller numbers. He hypothesised that the Little Bustards visiting the Black Sea coast might breed within Europe, unlike the flocks that visit the Shiraki and Iori river valleys (Iori plateau) in the very east of Georgia,

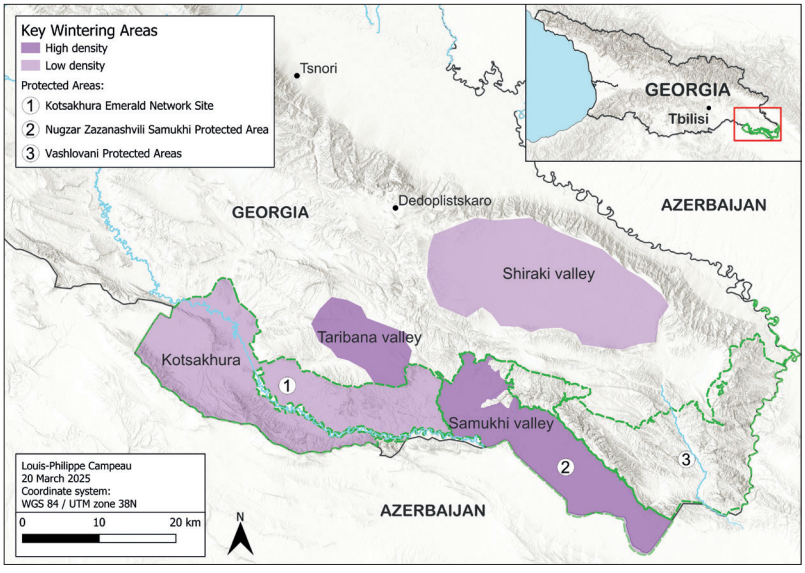

Figure 1. Key contemporary wintering areas of Little Bustards in Georgia.

Plate 1. Calling male Little Bustard near Dedoplistskaro, Georgia, June 2024. © *Sergey Bystritsky*

near Azerbaijan. Nowadays, however, sightings from western Georgia are limited to occasional individuals during migration, and no regular wintering flocks occur there, although very recently small wintering flocks (estimated at 100–200 individuals) have been seen in several successive years on the fields around Katsoburi Managed Reserve in south-western Abasha municipality (G Metreveli pers comm). Markov (1955) noted that most flocks of wintering birds came from the Azerbaijani side into the semi-arid territories of southern and eastern Georgia, most notably Marneuli, Bolnisi, Sagarejo and especially Dedoplistskaro municipalities, besides the environs of Tbilisi. This situation remains more or less the same today, with hunters reporting that small flocks are sometimes seen as far south as Gardabani municipality, which borders Azerbaijan in the Kura river valley.

While the Little Bustard is primarily a wintering species in Georgia, Markov mentioned that it once bred on the Javakheti Plateau (1800 m asl) according to local inhabitants. In 2017, local ecologist Dachi Shoshitashvili witnessed a courtship display by a male Little Bustard further east in Dedoplistskaro municipality, in the Kakheti region of extreme eastern Georgia. Several females were seen nearby, but breeding has not been confirmed (https://t.ly/MMtyn). Another observation was reported on 12 June 2024, when Sergey Bystritsky photographed a solitary calling male Little Bustard near Dedoplistskaro (Plate 1). The bird was still present three days later, but no females were seen on either occasion. The current extent of Little Bustard breeding in Georgia requires additional research.

METHODS

We conducted surveys over four winters in the years 2020–2024. The first field survey in January 2021 was organised by the Society for Nature Conservation (SABUKO) in a collaborative effort with several small teams of observers (https://t.ly/gkaZl). Each team started the count at the same time and covered different points in Dedoplistskaro municipality. This collaborative counting technique provided more accurate data by covering a larger area and minimised the possibility of either missing large flocks or double-counting birds. We covered five sites: the steppes of Vashlovani National Park; adjacent steppes around Kotsakhura ridge and Chachuna Managed Reserve (Kotsakhura Emerald Network Site); Taribana valley; Shiraki valley; and Samukhi valley, now a newly established protected area named Nugzar Zazanashvili Samukhi Multipurpose Use Protected Area. This last site contains the main transboundary wintering location for big flocks of Little Bustards and is designated as IUCN Protected Area Category VI—a protected area with sustainable use of natural resources.

Plate 2. Typical habitat for wintering Little Bustards, Kotsakhura Emerald Network Site, 2024. © *Nika Budagashvili*

The data from subsequent winter seasons (December–February 2021–22, 2022–23, and 2023–24) were collected opportunistically through counts of Little Bustard flocks during other projects. Additionally, in December 2023–January 2024 we collaborated with colleagues in Azerbaijan on a transboundary coordinated count.

During all surveys we kept general notes on the habitats in which the flocks were found. To assess the size of the larger flocks encountered, we used reference points to subdivide the flocks into more manageable subunits. We then counted the number of birds within some of these blocks and extrapolated that count to blocks with similar densities to estimate the total number of birds. When possible, photographs and videos were taken, which allowed us to count the birds more accurately. Finally, to complement these data and avoid overlooking large wintering flocks, social media platforms and open access citizen science platforms were consulted, and records by local and visiting birdwatchers were assembled.

RESULTS

Distribution, habitat and population estimates

The main wintering sites for Little Bustards in Georgia are located in protected areas or their vicinity. The three key areas are the newly created transborder Nugzar Zazanashvili Samukhi Multipurpose Use Protected Area, the Kotsakhura Emerald Network Site and the unprotected Taribana valley (Figure 1, Plates 2, 3). Little Bustards were also found in smaller numbers around the larger Vashlovani National Park (which borders the Nugzar Zazanashvili area) and the unprotected Shiraki valley. The biggest roosting flocks are often in the Nugzar Zazanashvili Samukhi Multipurpose Use Protected Area (Samukhi valley), which borders Azerbaijan and where disturbance factors are absent or very limited because of the strict militarised control of the border area.

Plate 3. Little Bustards feeding in their preferred habitat in Georgia, Taribana valley, 2022. © *Nika Budagashvili*

Currently, Little Bustards in Georgia are found predominantly in the country's eastern semi-deserts, which are characterised by sparse vegetation. These habitats typically feature dry, sandy or rocky terrain with sporadic patches of shrubs and medium-sized grass (Box *et al* 2000). The most widespread habitat type in the region is Submediterranean Artemisia steppe, as classified by EUNIS (European Nature Information System). The open arid forests are dominated by pistachio *Pistacieta mutica* mixed with juniper *Juniperus foetidissima* and *J. polycarpos*. The phrygana-like vegetation, found mostly on badlands, is dominated by low, dense, drought-resistant small trees and shrubs (*Tamarix* spp., *Hippophae rhamnoides*, *Reaumuria alternifolia*, *Caragana grandiflora*, *Atraphaxis spinosa*, *Paliurus spina-christi*, *Ephedra distachya*). The semi-desert vegetation is characterised by *Artemisia lerchiana* mixed with *Salsola ericoides* and *Gamanthus pilosus*. The steppe vegetation is dominated by Graminaceae (*Stipa lessingiana*, *S. capillata*, *Bothriochloa ishaemum*, *B. caucasica*, *Onobrychis* spp, *Glycyrrhiza glabra*) (Lachashvili *et al* 2007, Lachashvili & Khachidze 2010). These habitats are used by human communities as winter pastures, such that wintering Little Bustards have co-existed with nomadic shepherds and sheep for centuries. Despite their arid conditions, semi-deserts often support a variety of resilient plant and animal species adapted to survive in harsh environments. In general, Little Bustard flocks are mostly observed in places where steppe vegetation (*Artemisia* spp *etc*) is comparatively high and dense, as well as on green wheatfields.

During the first and most intensive year of monitoring (winter 2020–2021), we counted around 10 000 individuals across south-eastern Georgia through our collaborative efforts (Table 1). An exceptional observation of a single flock consisting of as many as 10 000–15 000 individuals was made by NB with N Paposhvili and G Epitashvili (both Ilia State University) in January 2019. The earliest flocks generally appear in Georgia in late November and some smaller flocks remain until the first two weeks of March.

Our survey findings from 2021 to 2024 show notable fluctuations in the wintering numbers of Little Bustards in Georgia (Table 1). In 2020–2021, a relatively stable population totalling about 10 000 individuals was recorded at five important sites with high-quality estimates. In 2021–2022 the population estimate expanded to 10 000–20 000, but with slightly lower reliability. The 2022–2023 season had another significant increase in Little Bustard numbers, with estimates ranging from 20 000 to 70 000, but again with lower quality estimates. In 2023–2024 numbers fell sharply to between 1000 and 2000 individuals.

Table 1. Population estimates for the Little Bustard in Georgia, 2021–2024. Interannual fluctuations in this table are likely to represent irregular movements of individuals across an international border rather than changes in the Georgia–Azerbaijan transborder wintering population. The Little Bustard has only been observed incidentally during the breeding season and its breeding status needs confirmation. Quality of estimate: 1 = low, 5 = high.

Season	Year	Number of birds	Important sites	Quality of estimate
Late autumn to early spring	2020–2021	10 000	5	5
	2021–2022	10 000–20 000	5	4
	2022–2023	20 000–70 0000	5	3
	2023–2024	1000–2000	5	3

Threats and conservation actions

Little Bustards face a series of threats as they winter in eastern Georgia. The first consists of changes in land use. Wintering Little Bustards feed on the seeds of plants, as well as on emerging plants and wheat seedlings in late winter and early spring. However, large tracts of traditional Little Bustard wintering sites not located within protected areas have been recently transformed into vast olive and almond tree plantations unsuitable for Little Bustards (Plate 4). This has occurred through the sale of lands from local owners to businessmen who convert the agricultural zoning to allow plantations. We could clearly see the increase in this practice during our annual monitoring of the Little Bustard's wintering range.

This destruction of steppeland not only reduces the habitats available for wintering Little Bustards but also worsens existing conditions of overgrazing. Local cattle, sheep, goats and cows are already unsustainably grazed, leading to reduced grassland cover and habitat degradation (Gintzburger *et al* 2012, Gunya *et al* 2019). As more land is diverted to commercial tree plantations, the remaining pastures are under ever-increasing pressure, with real risks of desertification.

The combined effects of plantations and overgrazing have fragmented the Little Bustard's wintering grounds. In a worst-case scenario, protected areas could be the last places where suitable habitat remains for the species, although there too the threat of overgrazing remains. The need to move between patches of low-quality and disturbed habitat may increase the vulnerability of flocks to a third threat: poaching. Poachers continue to target Little Bustards, even though they are a protected species in Georgia, listed as vulnerable (VU) on the National Red List (2014), with a fine of 400 GEL (*c*US$ 150) per individual killed. According to a Facebook post of the State Sub-Agency Department of Environmental Supervision on 10 December 2016, a group of poachers was apprehended in the Dedoplistskaro municipality (https://t.ly/U29Rf) with 16 illegally killed Little Bustards.

Despite these threats, there are positive developments. In 2022, the Parliament of Georgia approved the Law on the Establishment of Nugzar Zazanashvili Samukhi Multipurpose Use Protected Area (IUCN Category VI), with the purpose of both securing the long-term survival of the reintroduced Goitered Gazelle *Gazella subgutturosa* and protecting the major wintering site for Little Bustards. The management plan for the protected area, under preparation, will provide additional legislative levers to those fighting to protect Little Bustards in their wintering range in Georgia.

Plate 4. Habitat conversion to olive plantations in the Little Bustards' wintering range in the Taribana valley, 2024. *© SABUKO – Society for Nature Conservation*

DISCUSSION

Our observations support the hypothesis that most wintering Little Bustards in Georgia are part of a single wintering population that moves from adjacent areas of Azerbaijan using the transboundary semi-arid steppes of the Kura, Iori and Alazani river valleys. We recorded strong annual fluctuations in Georgia's wintering numbers of the species, with a high of some 70 000 individuals in 2022–2023 and a low of only 1000–2000 the following winter. We assume that movements of a large portion of this transborder population into Georgia are linked to the availability of food resources and pressures from disturbance, but research is needed to establish the causes. Vereshchagin (1940) noted that Little Bustards prefer green agricultural fields rather than natural steppes for feeding; such resources are available on the Azerbaijan side of the border. These large fields may also offer reduced disturbance, as public access to them is restricted. However, powerlines in the vicinity of the fields are known to kill Eastern Imperial Eagles *Aquila heliaca* monitored by GPS telemetry by SABUKO (NB unpublished data), and doubtless represent a threat to Little Bustards also.

Although at times the majority of the transboundary population of Little Bustards may cross into Georgia, the number of wintering Little Bustards in the country generally ranges from 10 000 to 20 000 individuals each winter. Thus, an estimate of the size of this transboundary population cannot be made by simply adding uncoordinated survey counts taken in both countries; and trends in the transborder population size cannot necessarily be interpreted from counts in a single country. To refine our winter estimates and reduce the risk of double counting, regular coordinated counts across both sides of the border are required, preferably in the middle of the winter season. Unfortunately, on the dates chosen for implementation of this coordinated methodology from December 2023–January 2024, no birds were observed on the Georgian side of the border. The largest flock we observed

during an independent survey on 9 December 2023 consisted of 260 Little Bustards in the Taribana valley, although as many as 1000 Little Bustards were observed in the Samukhi valley in January by visiting birdwatchers. During the coordinated survey, 27 000–28 000 Little Bustards were observed across the border in Azerbaijan in different wintering locations, including Jeyranchol agropark and near Ajinohur and Korchay (Z Farajli pers comm). The reasons for the paucity of wintering Little Bustards in Georgia at that time are unknown, but did not seem to be related to weather conditions. We recommend repeating coordinated surveys in future winters to assess whether the most recent counts of Little Bustard in Georgia represent a decline.

To conclude, the Little Bustard continues to use eastern Georgia as an important wintering site, especially in harsher winters, although more precise data can only come from transborder surveys coordinated with Azerbaijan. Its pastureland habitat is rapidly being lost to olive and almond tree plantations and degraded by overgrazing, which is further aggravated by pastureland loss. This fragmentation of wintering habitat increasingly concentrates flocks in dispersed, isolated locations, rendering them more vulnerable to poaching. Positive developments, such as the notification of the Nugzar Zazanashvili Samukhi Multipurpose Use Protected Area, and SABUKO's work to restore pasturelands, would be well complemented by the official protection of the key Samukhi valley wintering site.

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