Warming temperatures and reduced snow cover are associated with new wintering grounds for the Little Bustard *Tetrax tetrax* in Uzbekistan

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Summary: Little Bustards *Tetrax tetrax* historically wintered in large numbers across the plains of southern Uzbekistan, but by the late 20th century their populations had greatly declined. In the early 2000s, winter flocks were still being recorded in Surkhandarya and Kashkadarya provinces. Recent observations (2018–2025) indicate that the species is wintering farther north in Uzbekistan than historically noted, shifting into Jizzakh and Syrdarya provinces. Since 2023, a number of large congregations have been noted near Dashtobod (Syrdarya province), with one reaching around 6500 birds in January 2025. Analysis of climatic trends in Uzbekistan indicates a warming pattern, likely facilitating this northward shift by improving habitat conditions and food availability. However, habitat degradation, poaching and the risk of collisions with powerlines still pose serious threats.

INTRODUCTION

The Little Bustard *Tetrax tetrax* inhabits open grasslands, steppes and semi-deserts across a wide range from western Europe to Central Asia and western China (BirdLife International 2018). Populations migrating through Uzbekistan primarily breed in Kazakhstan's extensive steppe and semi-desert habitats (Gavrilov & Gavrilov 2005), and typically appear from late March to early May and again from mid-August to November (11 stopover sites marked in Figure 1), although some birds remain throughout the winter (from December to February; authors' unpubl data). Breeding has also been documented in Uzbekistan's piedmont plains, although only on a few occasions: in 1990 in the foothills of the Turkestan range (Jizzakh province), and in May 1998 in the low Aktau foothills (Navoi province, south of Nurata) (Kreuzberg-Mukhina 2003). Historically, large winter congregations occurred regularly in southern Uzbekistan, where thousands of birds were observed in the early 20th century. However, from the mid-20th century onwards, these congregations declined sharply to hundreds, then to mere dozens of birds, with only sporadic sightings thereafter (Kreuzberg-Mukhina & Lanovenko 2003, Kreuzberg-Mukhina *et al* 2003). This decline has been attributed largely to poaching, agricultural intensification and other anthropogenic pressures.

In February 2001, significant winter congregations of the Little Bustard were rediscovered in agricultural areas of Surkhandarya province, near the border with Afghanistan. Surveys conducted in winters 2002–2004 confirmed regular flocks ranging from 15 to over 600 individuals (Kreuzberg-Mukhina & Lanovenko 2003, Kreuzberg-Mukhina *et al* 2003). Later observations (2006–2007) indicated even larger flocks of up to 1500 birds (E Lanovenko pers comm). Despite their cautious behaviour, however, Little Bustards faced significant threats from local poaching and trapping, raising conservation concerns. The status of the species in Uzbekistan was most recently evaluated as Vulnerable (Lanovenko & Filatova 2019), and the species is protected from hunting.

We investigate the winter status of the Little Bustard throughout Uzbekistan from 2011 to the present day, explore climatic factors which may influence its current distribution, and describe threats to the species in this territory.

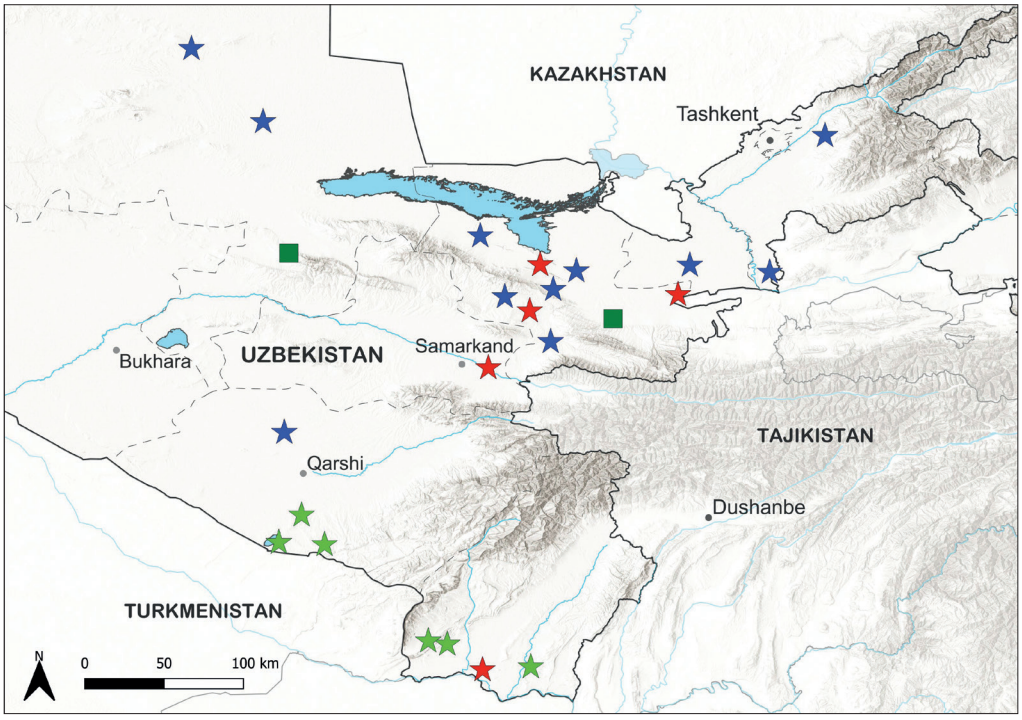

Figure 1. Historical and recent distribution of Little Bustard in Uzbekistan. Historical migration stopover sites (pre-2000) are marked with blue stars, historical wintering sites (2000–2010) with green stars, and recent wintering sites (2018–2025) with red stars. Known breeding events (1990s) are marked with dark green squares.

METHODS

In southern and central Uzbekistan, open dry steppe and semi-desert landscapes form the core habitats for Little Bustards, featuring sparse sagebrush *Artemisia* and saltwort *Salsola* communities, plus fallow fields and rain-fed cereal crops. Intensive grazing, farming and infrastructure projects influence habitat condition and availability. Surkhandarya province in the south has traditionally supported most winter Little Bustard flocks, whereas central provinces, including Syrdarya, Jizzakh and Samarkand, were until recently used mostly during migration.

Records of wintering Little Bustards in Uzbekistan from 2011 to early 2025 were compiled from field notes by local ornithologists, local birdwatchers and citizen-science platforms (birds.uz, eBird), with verification via photographs or independent reports whenever possible. Historical context was obtained from earlier literature and the Red Data Book of Uzbekistan (2019). Wintering grounds were defined as sites where groups of Little Bustards remained for two or more weeks during the core winter period, defined as December–February.

To assess the role of climate, we reviewed Uzbekistan's meteorological data (2010–2025; Hydromet 2025, Zoï Environment Network 2018), comparing winter temperatures and precipitation from the 2010s with the early 2020s. To visualise shifts in distribution, we conducted geographic mapping of historical and recent wintering grounds in QGIS 3.0 (Figures 1 and 2).

Table 1. Population estimates for the Little Bustard in Uzbekistan. *The 1000–2000 birds in southern Uzbekistan up to 2023 may all be a subset of the 6500 in Dashtobod in 2025; we compromise by only counting the lower number for southern Uzbekistan in this total; ** in Jizzakh province; *** in Navoi province. Quality of estimate: 1 = low, 5 = high.

Season	Number of birds	Important sites	Quality of estimate	Population trend			
				1950–1990	1990–2020	2020–2023	1950–2023
Breeding	2–10 individuals	Turkestan range**, Aktau foothills***	1	↘	↘	↘	↘
Wintering	6500–7500 in 2025*	2	3	↘	↗	↗	↗
Dashtobod	6500 in 2025			N/A	N/A	↗	↗
Southern Uzbekistan	1000–2000 up to 2023			↘	↗	→ ?	↗

RESULTS

As described in the Introduction, the Little Bustard historically wintered primarily in southern Uzbekistan (Table 1), but winter observations became scarce by the late 20th century owing to habitat loss. However, from the early 2000s, regular wintering was again confirmed in Surkhandarya and Kashkadarya provinces, where numbers appear stable at around 1000–2000 individuals, and in March 2023 a single flock of 2000 was recorded there (authors' unpublished data). More recently, since 2018, much smaller numbers ranging from single birds to several dozen have been recorded at four sites further north, in Jizzakh and Samarkand provinces, suggesting a gradual northward shift, although a fifth site, Kampyrtepa near the Amu Darya river floodplain, involved 100 birds on 21 January 2018 and 70 birds on 17 February 2021, in the more traditional wintering zone (Figure 1).

In 2019, single birds and small groups were noted in the northern piedmont plains of the Nuratau range (Jizzakh province), while in 2024, 30–50 birds were observed on the range's southern piedmont. On 18 January 2023, a flock of 53 was seen in Zarafshan National Park (Samarkand province), where it remained for about a week in agricultural fields interspersed with tamarisk shrubs. These observations point to a continued northward expansion, including a major new wintering site, located approximately 5.6 km north-east of Dashtobod town centre in Syrdarya province, near the border with Jizzakh province and the international frontier with Tajikistan (Figure 2).

The new Dashtobod site

The site north-east of Dashtobod represents a shift some 200–300 km north of any previously documented wintering sites. Multiple large flocks have been recorded here, starting with 500 birds on 1 December 2023 (AR pers obs), then in 2024, 2500 on 18 January (TA, MM pers obs), 4000 on 21 January (MG, E Salimov pers obs), 6000 on 10 February (TA, E Fejes pers obs), 800 on 22 February (TA pers obs), and in January 2025 6500 (R Granovskaya, V Egorov pers obs; Plate 1), the largest single flock reported in Uzbekistan to date.

Information about the Little Bustard's wintering flocks at this site initially came from local hunters. Field observations by a group of birdwatchers (*birds.uz*) revealed that the birds largely congregated around a farm using centre pivot sprinkler irrigation (Figure 3). This farm is partially fenced, offering a degree of security from disturbance. However, hunters' accounts raise concerns that systematic poaching may persist in the region.

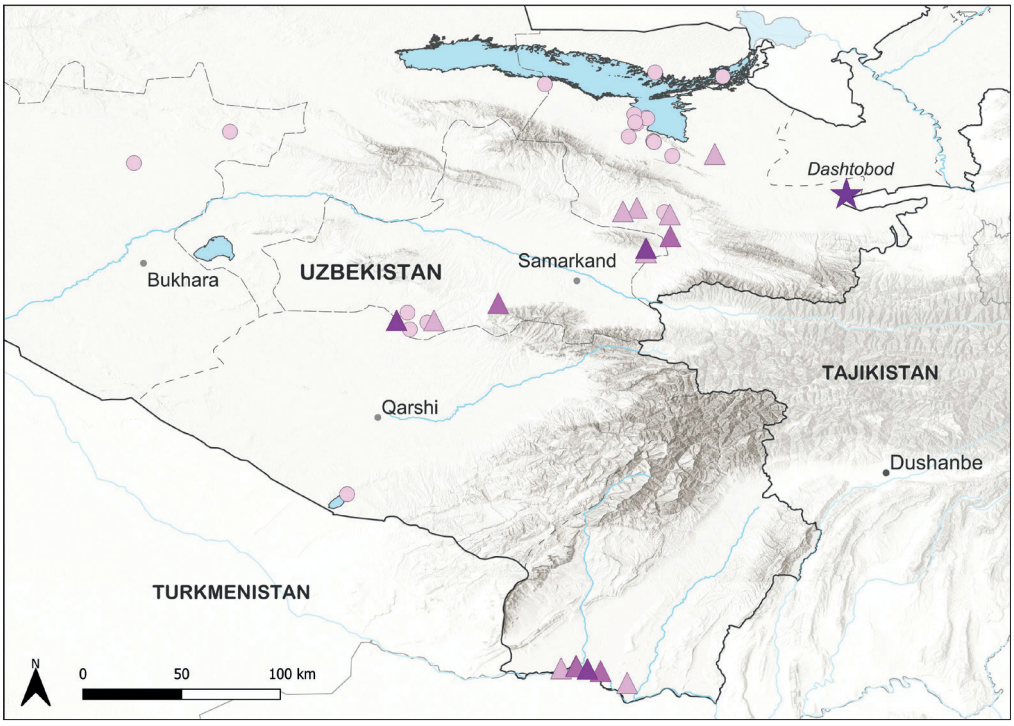

Figure 2. Recent distribution and size of Little Bustard wintering aggregations in Uzbekistan (2018–2025). Pale circle = 1–10 birds; triangles from pale to dark = 10–50; 50–100; 100–1000 birds; star = 6500 birds (Dashtobod).

Climatic trends

All areas of Uzbekistan exhibit a winter warming of about 0.2 to 0.5°C per decade (around 0.3°C overall), consistent with broader climatic changes in Uzbekistan, where mean annual temperatures have increased by roughly 1.6°C since 1880 (IISD 2025). Southern provinces (Kashkadarya, Surkhandarya) display notably milder winters, with fewer severe frosts (Hydromet 2025) and more frequent positive temperature anomalies. Several winters since 2018 rank among the warmest on record, with January averages near 0°C (compared to historical −2 to −3°C).

Although total winter precipitation varied between 70 and 130 mm with no distinct upward or downward trend, higher winter temperatures mean a growing proportion of precipitation falls as rain rather than snow, leading to briefer and rarer snow cover (Hydromet 2025).

Threats

Most reports regarding novel wintering grounds for Little Bustards in Uzbekistan initially came from responsible local hunters who passed on information on ongoing illegal hunting that they obtained through their networks. Field observations near Dashtobod by the birds.uz team indicate that the Little Bustards tend to gather around a partially fenced farm, which offers some measure of security from disturbance. However, systematic poaching of Little Bustards persists in the area.

On 14 November 2024, a nature-oriented Telegram channel (Ecolog.uz) criticised posts shared by another Telegram channel (Mokhir ovchilar; in Uzbek: 'Skilled Hunters') which featured images of 4–5 injured and killed Little Bustards (Plate 2). This incident highlights the continued vulnerability of the species to poaching, despite legal protection.

Plate 1. Little Bustards at Dashtobod, Jizzakh, Uzbekistan, 12 January 2025. © *Relisa Granovskaya*

DISCUSSION

Recent observations of Little Bustards in Uzbekistan have come primarily from incidental records by birdwatchers and researchers conducting work unrelated to the species. Dedicated, species-specific surveys are needed to verify population trends, define habitat preferences, evaluate threats and inform targeted conservation measures. Despite these data gaps, field observations during the winters of 2023, 2024 and 2025 clearly suggest a northward expansion of the Little Bustard's wintering range. Syrdarya, Jizzakh and Samarkand provinces—historically known primarily as migratory corridors—now host regular winter flocks. This shift appears tied to warmer winter temperatures (averaging +0.3°C/decade) and reduced snow cover, which may facilitate suitable foraging conditions, including access to waste grains and green shoots. Sites such as Dashtobod reflect these favourable conditions, although the flocks can disperse rapidly under adverse weather. The dramatic drop from 6000 to around 800 birds in mid-February 2024 followed heavy snowfall, underscoring the unpredictability of conditions on these new wintering grounds.

Plate 2. Evidence of illegal poaching of Little Bustards in Uzbekistan (social media post, source: Ecolog.uz). *Anon*

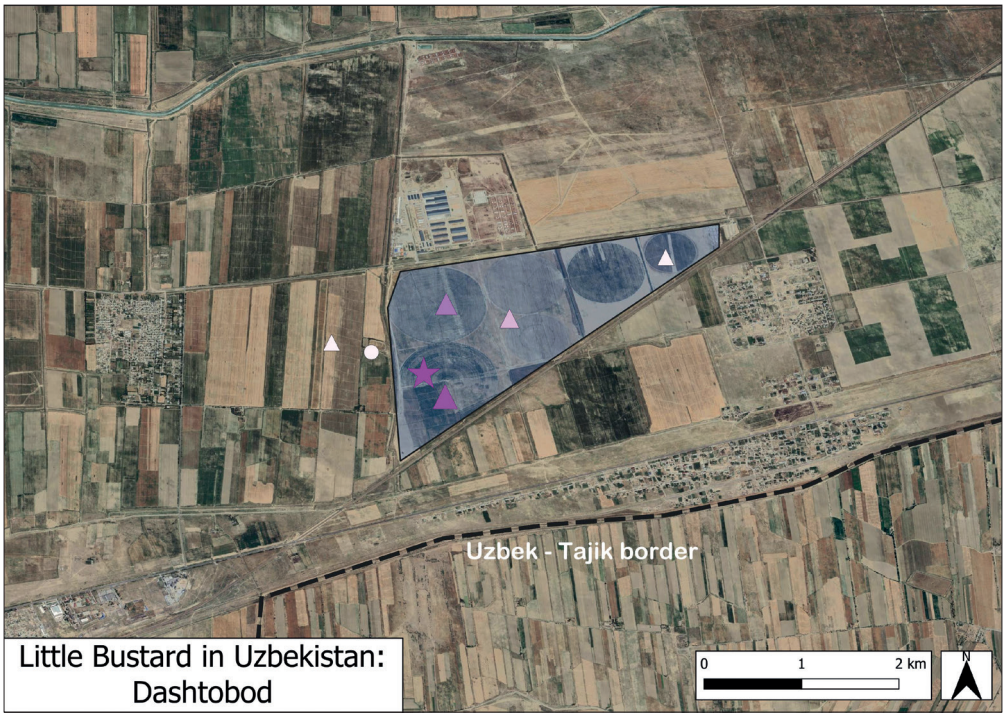

Figure 3. Satellite imagery showing the new (partially fenced) wintering area (grey-blue triangle with large dark circles of pivot irrigation) near Dashtobod, Syrdarya province. The pale circle represents the 2023 observation (500 birds); triangles those of 2024 (from pale to dark: 300-800, 2500, 4000 and 6000 birds respectively); the star for 2025 (6500 birds).

Defining 'wintering' sites as locations where groups of Little Bustards remain for multiple weeks helps distinguish them from late-migrating flocks. However, the line between migration and wintering can be blurred: mild weather can prompt birds to stay, while severe cold and snow may trigger further migration to the south. Even so, the consistent reappearance of winter flocks in the fenced agricultural fields of Dashtobod and elsewhere in central Uzbekistan suggests that local factors—low snow cover, irrigated farmland, roosts with lower levels of disturbance—can facilitate over-wintering.

New wintering sites create both opportunities and challenges. On the one hand, aggregations of up to several thousand birds present opportunities for focused conservation: if well protected, these flocks could help sustain the regional population. On the other, illegal hunting can easily target these large conspicuous flocks. Infrastructure hazards, notably the risk of collisions with overhead powerlines, may also pose a significant threat; for instance, at Dashtobod the railway borders the wintering site, and the overhead contact line could be dangerous for Little Bustards. Collaborations with local communities, as well as measures such as the creation of seasonal ornithological refuges, could mitigate these pressures.

The significant northward shift of Little Bustard wintering grounds into central Uzbekistan—evidenced by flocks of up to 6500 birds—underscores the species' adaptability amid changing climatic conditions. While this shift may signal a partial population recovery, continued threats such as habitat degradation and poaching could negate these gains. In addition, overhead powerlines pose collision risks for large wintering flocks. Urgent measures, including habitat protection, stricter poaching regulation and ongoing surveillance, are essential to safeguard these birds. If effectively managed, Uzbekistan's

expanding winter range could offer a significant contribution to the conservation of this species across Central Asia.

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