The loss of wintering Great Bustards *Otis tarda tarda* from the steppes of Azerbaijan

ZULFU FARAJLI

Summary: The Great Bustard *Otis tarda tarda* was abundant in winter in steppe and semi-desert in Azerbaijan in the mid-20th century and bred in small numbers in the south, but rapidly declined so that by the 1990s breeding had stopped and non-breeding visitors only numbered around 100. Now only up to 10 birds are thought to visit per year, scattered between up to four sites. There are two migration routes, one through the west and one round the eastern littoral. Hunting and agricultural development are considered responsible for the plight of the species.

INTRODUCTION

The current global population of Great Bustard *Otis tarda tarda* is estimated to be lower than 60 000 individuals (Alonso 2014) and the species is listed as Vulnerable by IUCN. Historically it had a much larger distribution and was formerly abundant in Azerbaijan. The largest of three bustard species in Azerbaijan (Little Bustard *Tetrax tetrax* and Asian Houbara *Chlamydotis macqueenii* also occur), it is included in the Red Book of the country (MENR 2013). In the middle of the last century, it was considered abundant in winter in Azerbaijan, with a small breeding population (Patrikeev 2004). However, in the 1990s there were no confirmed breeding records and fewer than 100 individuals were thought to occur on migration and in winter (Patrikeev 2004). Here I present historical records of Great Bustards in Azerbaijan and update the current population estimate.

HISTORICAL RECORDS

Breeding & summer records

It is likely that Great Bustards have always been a relatively scarce breeding species in Azerbaijan. Radde (1884) observed many adults while travelling between Shamakhi and Mugan in mid-April, mostly pairs. He also saw birds south of Salyan, where they both breed and winter (Radde 1884). One nest was found in Alpaut (Alpout), Mugan steppe, in May 1912 by Satunin (Point 1 on Figure 1), who also recorded six individuals in Aslan Duz (bordering Iran) on 11 July (Point 2 on Figure 1) (Vereshchagin 1940). Vereshchagin (1940) himself also observed Great Bustards during the summer months, for example noting a flock of four adults feeding on locusts on 14 June 1939, near Sigirli village, Shirvan steppe (Point 3 on Figure 1). It is thought that the species probably continued to breed in small numbers in Azerbaijan until the 1950s, after which its decline became more apparent (Patrikeev 2004). A similar considerable decline in the Great Bustard populations breeding in the Russian Caucasus was also observed in the second half of the last century (Dzhamirzoev & Bukreev 2008).

Migration

Great Bustards migrated through Azerbaijan in both spring and autumn, mostly singly or in small groups and mainly by day, and were presumed to be from the breeding population in the Volga region of Russia (Vereshchagin 1940). There were thought to be two migration routes, one coastal and one inland (Figure 1). The coastal route followed the Caspian shore in the autumn, when birds flew at an altitude of 50–100 m, rarely up to 300 m (Vereshchagin 1940). In the spring, birds returned by the same route, although some were observed migrating a few kilometres away from the shoreline. The last record of regular migrating Great Bustards utilising this coastal route was in March 1969 in the

Figure 1. Black arrows: inland and coastal migration routes of Great Bustards through Azerbaijan. Blue triangle: Alibeyli meteorological station where high numbers of migrating Great Bustards observed by MS worker. Red dots: breeding or summer records of Great Bustards: 1 - A nest in Alpaut, Mugan (1912); 2 - Aslan Duz (1912); 3 - Sighirli, Shirvan (1939); 4- Julfa, NAR (2005).

Samur river delta near the Azerbaijan–Russia border (But'ev *et al* 1989), and only a handful of single birds have been observed in the southern Dagestan region in recent decades (Dzhamirzoev & Bukreev 2008).

The inland migration route passed through the west of Azerbaijan over the Caucasus mountain ridges towards the Nakhchivan Autonomous Republic. Workers at the Alibeyli meteorological station close to Zagatala, in the north of the country, recorded both Great and Little Bustards during autumn migration using this route annually between 1931 and 1937, with the capture of two Great Bustards being reported in October 1934 (Vereshchagin 1940). Migrating birds were historically recorded at Gokcha (Sevan) lake, Armenia, just across Azerbaijan's western border, in April and September (Radde 1884). There are also some historical sightings of late migrants or wintering birds in easternmost Georgia near the Azerbaijani border, including three individuals in Iormuganlo village on 23 November 1972 and one in northern Vashlovani nature reserve on 18 December 1976 (Abuladze 1992). The inland route was also used in the spring, with, for example, 18 Great Bustards observed heading north in March 1937 from the Alibeyli meteorological station (Fig. 1) (Vereshchagin 1940). Birds using this route were clearly capable of migrating at higher altitudes as they passed over the Caucasus; 34 were seen at 1900–2000 m on 14 February 1938 (Vereshchagin 1940). Old records indicate that by the end of March most wintering Great Bustards had left Azerbaijan.

Wintering

Radde (1884) noted that Great Bustards did not appear before the start of the calendar year in Mugan and left by April. He also mentioned that during periods of snow birds were forced to relocate to river valleys where they could find suitable feeding habitat and shelter (Radde 1884). According to Vereshchagin (1940), Great Bustards were commoner in Acinohur, Shirvan and Mugan steppes, and islands or coastal areas of Qizilagach,

in winter (no months specified). As already noted, there have been very few records of wintering Great Bustard in recent decades. However, there are some recent claims of wintering Great Bustards from locals in eastern Georgia, close to Azerbaijan (A Abuladze pers comm).

HABITAT CHOICE

The main historical wintering areas are the steppe and semi-desert areas of Acinohur, southern Shirvan and Mil-Mugan, as well as the coastal areas of Qizilagach bay (Vereshchagin 1940). The birds fed on ploughed fields with emerging weeds and were seen taking locusts in Shirvan (Vereshchagin 1940). In neighbouring Armenia, Great Bustards prefer wide flat areas, alfalfa fields, and low-vegetation steppes (Adamian & Klem 1997). Similarly, in Spain and other parts of the species' range, agricultural habitats are important (Lane *et al* 2001), and there is no obvious reason why this would not be the case in Azerbaijan.

CURRENT STATUS

Nowadays the Great Bustard is rare in Azerbaijan with only a few recent reliable records. There are several claims of observations around the country, but mostly of individual birds or small flocks.

Ten birds were observed in Shirvan national park in 2001 (MENR 2013), which presumably used the coastal migration route along the Caspian. More recently, systematic autumn migration counts at the Besh Barmag bottleneck (in Siyezen) have recorded no Great Bustards, although Little Bustards occur in significant numbers (Trektellen 2018, Heiss *et al* 2020). A single Great Bustard was recorded on the south shore of the Caspian Sea, close to Rasht in Iran, on 28 December 2018 and again on 3 January 2019 (Zirakjou 2018, Seifi 2019). Whether this individual passed through Azerbaijan or over the Caspian from Central Asia is not known. Given the paucity of recent records, especially during intensive monitoring at Besh Barmag, it is reasonable to assume that the coastal migration route of Great Bustard is now very rarely used by the species. There are more recent observations of Great Bustard using the inland migration route (probably continuing to Armenia and Iran). Six birds were observed in Julfa (Point 4 on Figure 1), Nakhchivan autonomous republic, on 9 May 2005 (MENR 2013). Rangers at the Qakh state nature sanctuary observed 8 birds in 2009 and 5 in 2011 during spring migration (specific timing not reported) (MENR 2013). In 2021, an individual was in Qakh in early March and three birds were observed in the Acinohur steppes between 10–14 March (A Muradov pers comm). Most records of Great Bustards from the last two decades have been during the autumn and spring migration periods with very few records from the typical wintering months of November to February. I conclude that the Great Bustard now only occurs as a migratory and occasional wintering species within Azerbaijan, and only in small numbers (Table 1).

It is worth noting that social media (mostly Facebook) postings by hunters' groups show that Great Bustards have been illegally killed in Azerbaijan in recent years. The specific timing and locations of the illegally killed birds could not be determined, but the images were circulated at times consistent with them being of migratory birds (Plate 1).

MAIN THREATS

Based on historical records and recent reports, poaching seems to be one of the biggest threats to the Great Bustard in Azerbaijan and indeed the wider Caucasus. Long ago Radde (1884) mentioned that in December tired birds were even hunted using sticks in Tbilisi. Similarly, large numbers of Great Bustards were caught along the Caspian coast

Table 1. The current estimated population of Great Bustards in Azerbaijan.

Season	Number of Great Bustards	Number of sites	Quality of estimate, from 1 (low-quality) to 5 (high-quality)
Breeding	0	0	4
Migration	5–10	3–4	3
Wintering	1–5	3–4	3

annually, mostly during autumn migration, especially at Besh Barmag and adjacent Gilazi (Vereshchagin 1940). The more recent confirmation of illegal hunting of Great Bustards within Azerbaijan (Plate 1) is of serious concern given the rarity of the species. The killing of a single Great Bustard could represent more than 10% of the Azerbaijani population (Table 1). It is illegal to kill Great Bustards in Azerbaijan (Azərbaycan Respublikasının İnzibati Xətalar Məcəlləsi 2015) and a combination of stricter law enforcement and education of hunters is urgently required. Other protected bustard species (Little and Asian Houbara) are also illegally hunted in the country, often by foreign hunters (Collar & Kessler 2021).

However, another major threat and perhaps the main reason for the sharp decline of the population in the middle of the last century is habitat destruction and the conversion to agriculture of historical stopover and wintering grounds. Interestingly, Vereshchagin (1940) did not consider that the protection of wintering Great Bustards in the eastern Caucasus was an urgent matter as the species is well adapted to agricultural lands. However, this was before various major developments in crop management. During the last century, population declines in the Russian steppes were linked to the widespread use of pesticides on cereal crops to kill rodents (Belik 1998). Many granivorous bird species were killed, resulting in the extinction of the Great Bustard population in Kalmykia which migrated to the Caucasus for the winter (Belik 1998). Additionally, the widespread use of pesticides may also reduce food availability in agricultural areas, making them less suitable for Great Bustards. Recent research from nearby Turkey identified agricultural intensification and livestock herding (disturbance and overgrazing) as key threats to Great Bustards (Özgencil *et al* 2021). Predation by shepherd/feral dogs could also pose a significant threat to nests and young birds.

As the species is large and low-flying, collision with powerlines is a serious threat especially during migration. In some parts of the world, the mortality rate from powerline collisions can be as high as 13% of the population (Alonso 2014).

CONSERVATION

There is an urgent need to confirm the status of the Great Bustard in Azerbaijan. Historical areas known to be used by the species such as the Acinohur, Shirvan and Mugan steppes should be surveyed and, if found to be still used by the birds, either designated as nature reserves or subject to appropriate conservation measures (especially annual monitoring and protection). Protection of such sites would be crucial for the survival of the species in Azerbaijan, and habitat management is certainly regarded as the best way to invest in Great Bustard conservation (Alonso 2014).

Tackling illegal hunting of Great Bustards and other rare and threatened species in Azerbaijan, involving local people in conservation, is also imperative. Additionally, training of farmers and hunters about the species and its ecology will result in higher

Plate 1. Illegally killed Great Bustard photos acquired from social media (Facebook). A: Shared on 13.09.2016, location is unknown. B: Shared in the same year, but exact date and location are unknown. *Anon.*

protection measures. After habitually used sites are identified, collaboration with landowners should be sought. For example, financial incentives for farmers to use a mix of crops, moderate irrigation and rotational fallows, all of which the species is known to prefer, can be suggested (Özgencil *et al* 2021). Historically, grazing livestock was a threat to Great Bustard nests as well. Even though the species seems not to breed now in Azerbaijan, certain locations of potential importance to Great Bustards should have grazing pressure controlled.

Collaboration with other range states, including potentially satellite-tagging birds on their breeding grounds, could lead to a much greater understanding of any populations that still migrate through Azerbaijan and the wider Caucasus. Ensuring energy infrastructure, such as transmission lines, use bird-friendly designs and are located away from key migration corridors would benefit not just Great Bustards but a wide range of other bird species.

ACKNOWLEDGEMENTS

I would like to thank Azerbaijan National Library for providing a copy of Vereshchagin (1940). Also, I want to thank Dr Mimi Kessler and Dr Rob Sheldon for their valuable comments and contributions to this work.

LITERATURE CITED

Abuladze, AV. 1992. Great Bustard: brief reports. *Bustard Studies* 5: 67–72.

Adamian, MS & D Klem Jr. 1997. *Field Guide to Birds of Armenia.* American University of Armenia, Yerevan.

Alonso, JC. 2014. The Great Bustard: past, present, and future of a globally threatened species. *Ornis Hungarica* 22(2): 1–13.

Azərbaycan Respublikasının İnzibati Xətalar Məcəlləsi [Code of Administrative Offences of Azerbaijani Republic]. 2015. Maddə 291 [Article 291]. http://e-qanun.az/framework/46960. [In Azeri]

Belik, VP. 1998. [Why have Great Bustards disappeared in Russia?] [*Nature*] 1: 58–62. [In Russian]

But'ev, VT, AV Mikheev, AB Kostin & EA Lebedeva. 1989. [Notes on rare bird species of the Caucasian coast of the Caspian.] *In: Ornithological Resources of the Northern Caucasus.* Stavropol', pp137-152. [In Russian]

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

Dzhamirzoev, GS & SA Bukreev. 2008. [*Action Plans for Conservation of Globally Threatened Bird Species in the Caucasus Eco-region*]. Russian Bird Conservation Union, Institute of Biogeography and Landscape Ecology at Dagestan State Pedagogical University, Moscow & Makhachkala. [In Russian]

Heiss, M, K Gauger, C Himmel, P Fetting, TA Haraldsson, G Caucal, Z Farajli & 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.

Kaboli, M, M Aliabadian, M Tohidifar, A Hashemi & CS Roselaar. 2012. *Atlas of Birds of Iran.* Iran Department of the Environment, Tehran.

MENR = Ministry of Ecology and Natural Resources. 2013. [*Red Book of the Republic of Azerbaijan. Fauna*] 2nd edition. Institute of Zoology, National Academy of Science, Baku. [In Azeri]

Lane SJ, JC Alonso & CA Martin. 2001. Habitat preferences of Great Bustard *Otis tarda* flocks in the arable steppes of central Spain: are potentially suitable areas unoccupied? *Journal of Applied Ecology* 38: 193–203.

Özgencil, İK, F Akarsu, MM Karataş, A Ergen-Gürsoy, F Saygılı, M Karakaya & M Soyluer. 2021. Current status of Great Bustards *Otis tarda* in Turkey: population size, distribution, movements, and threats. *Bird Conservation International* doi:10.1017/S0959270921000289.

Patrikeev, M. 2004. *The Birds of Azerbaijan.* Pensoft Publishers, Sofia & Moscow (Pensoft Series Faunistica 38).

Radde, G. 1884. *Ornis Caucasica: die Vogelwelt des Kaukasus.* Verlag von Theodor Fischer, Kassel.

Seifi, A. 2019. eBird Checklist: https://ebird.org/checklist/S51372101. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: http://www.ebird.org (accessed 5 May 2021).

Trektellen 2018. https://trektellen.nl/site/yeartotals/1533/2018 (accessed 5 May 2021).

Vereshchagin, NK. 1940. [On Little Bustards and Great Bustards wintering in eastern Transcaucasia]. *Reports of the Azerbaijan Branch of Academy of Science* 5: 57-65. [In Russian]

Zirakjou, S. 2018. eBird Checklist: https://ebird.org/checklist/S51518031. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: http://www.ebird.org (accessed 5 May 2021).

Zulfu Farajli. fzulfu@gmail.com