Wintering geese of northwestern Black Sea coasts: results of coordinated monitoring 2017–2022

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Abstract

Northwestern Black Sea coasts support globally important numbers of wintering geese, especially Red-breasted Geese (RBG) *Branta ruficollis* but also large numbers of Greater White-fronted Geese (GWFG) *Anser albifrons* and regionally important Greylag Geese (GG) *Anser anser*. Despite good national mid-winter waterbird counts within Bulgaria, Romania and Ukraine, until recently there were no internationally coordinated counts at other times of the winter. Here, we present coordinated monthly count data from November to February in five recent winters (2017/18–2021/22) from the three countries, collected under a LIFE programme project to support RBG conservation. Mean annual maximum winter counts were 385,363 GWFG (range = 207,655–530,100), 20,919 RBG (13,741–26,834) and 9,728 GG (4,059–13,971) from standardised counts at the same sites throughout the region. Romania supported an overall mean of 77.3% of all GWFG from any one total count in all winter months, 65–95% in all years except for the mild winter of 2018/2019. Romania also contributed 66.3% of all RBG (range = 27%–92%) counted during coordinated international counts. Peak numbers of GWFG tended to occur in Romania in December, but corresponding increases in Bulgaria in January 2019 were the only suggestion of within-winter westward movements. Peak numbers of RBG in all winters generally were counted from January onwards, but again there were no clear patterns of consistent between-country movements in the course of the winter. These data provide a vital baseline for assessing the effects of recent

warfare in the region on the distribution and abundance of these critical goose populations, and underline the need for long-term coordinated monitoring over as large an area and as many wetlands as possible in future, in order to understand their long-term trends and the factors affecting them. Such data are also essential to support planning of effective conservation measures and better inform planning issues, such as those posed by wind turbine development occurring throughout the region.

Key words: *Anser albifrons*, *Branta ruficollis*, conservation, count data, Greater White-fronted Goose, Red-breasted Goose.

The low-lying sections of the northwestern coastline of the Black Sea in Bulgaria, Romania and Ukraine have long been recognised for their outstanding importance for wintering waterbirds (*e.g.* Alphéraky 1905; Dombrowski 1912; Dijksen *et al.* 1973; Dereliev 2000). This is due to the extensive wetlands and mild winter climate of this coastal fringe, which offer safe roosting sites close to rich feeding areas. Mean January temperatures along western and northern Black Sea coasts remain around or above freezing in Bulgaria, Romania and Ukraine (Anon 2022a, b). These same areas of fertile coastal lowlands also support extensive areas of intensive wheat production (USDA 2022a, b) and short-grazed productive Pontic steppe grassland (DMEER 2015), both of which occur in large open fields without cover for predators, providing ideal feeding habitat for foraging wild geese in winter. The wetlands of the coastal plain, together with the adjacent farmland, are therefore of outstanding global importance for Red-breasted Geese *Branta ruficollis* (hereafter RBG), almost the entire global population of which has apparently wintered in Romania and Bulgaria in recent years, and for > 300,000 Greater White-fronted Geese *Anser albifrons* (hereafter GWFG; Dereliev 2000; Dereliev *et al.* 2000; Cranswick *et al.* 2012). The RBG remains one of the most threatened goose species globally, listed on Annex I of the EU Birds Directive, as Vulnerable on the IUCN Red List (IUCN 2022), on Appendix II of the Convention on International Trade in Endangered Species (CITES) and Appendix I and II of the Convention on Migratory Species (CMS). The species breeds in the Taimyr, Gydan and Yamal Peninsulas of arctic Russia and formerly wintered along western Caspian Sea coasts, concentrated around Kyzyl-Agach Bay, but the replacement of winter wheat with cotton from the late 1960s was apparently responsible for the geese shifting to Black Sea coasts (Vinokurov 1977, 1992; Veen *et al.* 2007). Since the 1960s, the species has begun to winter around Black Sea coasts where it is thought that 80–90% of the population congregated in winter in the decades since, concentrated around 5–10 regularly used roost sites (Cranswick *et al.* 2012; BirdLife International 2022). The GWFG in the Black Sea represent one important regional element of the population that breeds in the western Russian arctic and winters from Britain in the extreme north and west, through Austria into the eastern

Mediterranean, Greece, Turkey, Syria and Iraq, extending through the northwestern Black Sea into the Caspian Sea (Fox & Leafloor 2018). The region has also been of central importance for wintering Greylag Geese (hereafter GG) *Anser anser* population that winters in the Black Sea, Turkey and Greece (Fox & Leafloor 2018).

The vast majority of wintering geese in the Black Sea region are confined to the northwestern coasts in Bulgaria, Romania and Ukraine (see, for example, the maps Pic. 16 and Pic. 28 in Kostiushyn *et al.* 2011). However, until 2012, there were few attempts to coordinate goose counts at the most important wintering sites along these extensive areas of coastline to generate reliable estimates of their current abundance. Following the realisation of the sensitivity of the RBG and especially its vulnerability to a variety of adverse anthropogenic factors (Cranswick *et al.* 2012), the need for regular coordinated counts to generate reliable abundance estimates became clear as a basis for its effective conservation. For this reason, one key objective of the EU LIFE project entitled "Conservation of the Red-breasted Goose along the Global Flyway" (LIFE16/NAT/BG000847) was to describe the winter distribution and abundance of RBG, particularly with regard to site safeguard measures in place to protect the species in the wintering grounds along the northwestern Black Sea coast. This was considered as a vital basis for identifying key wintering sites to support effective conservation management measures and to determine the size and status of its population to establish long-term population trends (Iliev *et al.* 2018, 2020, 2022). Although excellent national mid-winter waterbird counts within Bulgaria, Romania and Ukraine have been generating data on goose abundance and distribution, until recently there had been no coordinated international counts to ensure simultaneous count coverage in the three countries, nor attempts to count at other times of the winter. Here, we report on results from five winters of coordinated counts from the three countries to provide: (1) up-to-date assessments of the numbers of GG, GWFG & RBG wintering in the region, and (2) their within and between winter changes in distribution and abundance.

Methods

Under the monitoring programme, approximately fortnightly counts of geese arriving to the roosts in Bulgaria, Romania and Ukraine were planned, beginning in early November and continuing through to March in each year from 2017–2022. Maximum effort was invested in coordinated international counts weekends in the middle of December, January and February each year to provide a snapshot of numbers wintering in the region. Because of the extensive range of key sites within Ukraine and Romania, counts derived from over 3–5 days around the nominated weekends were accepted, depending on weather conditions. Between two and four observers were situated in preselected observation points 30 min before sunrise for 1.5–2 h to count numbers and species of geese departing known roosts (ending when all geese have ceased movement from roosts, see Iliev *et al.*

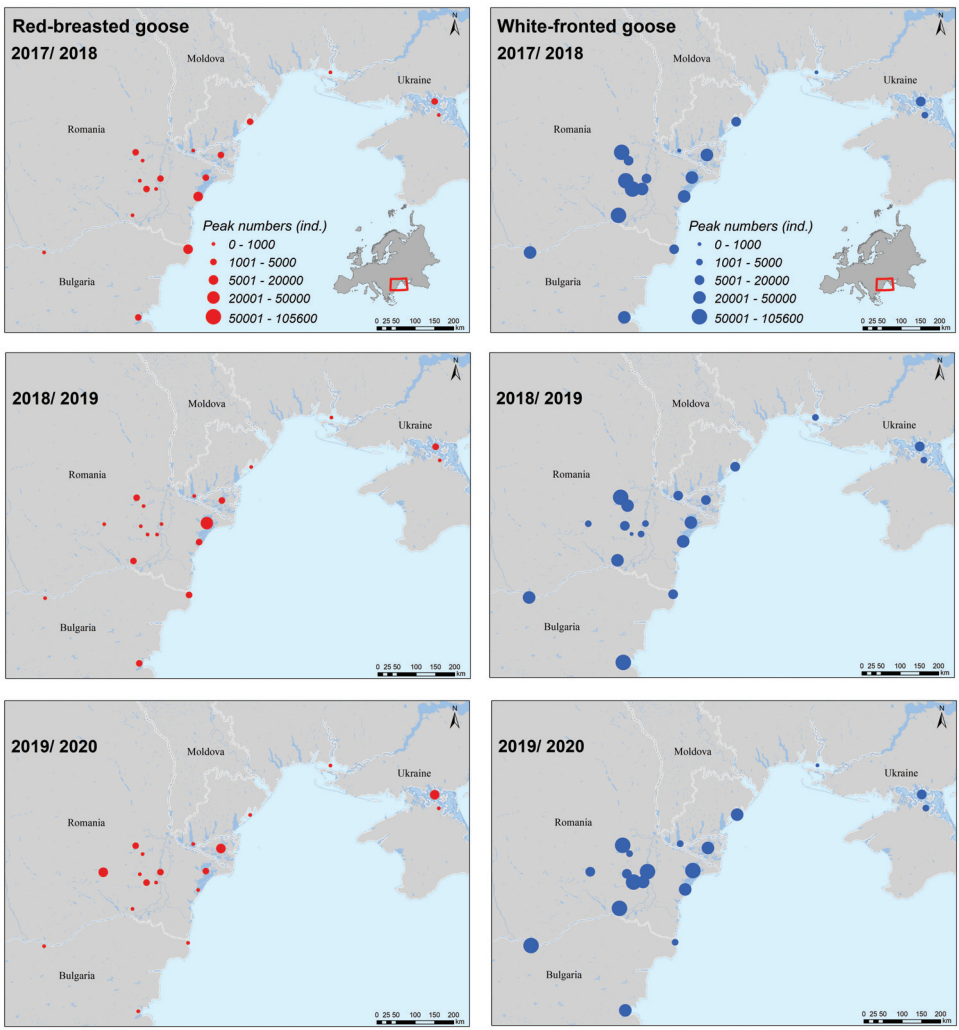

Figure 1. Maps showing the maximum winter counts of Red-breasted Geese (left, red symbols) and Greater White-fronted Geese (right, blue symbols), from all sites counted in Bulgaria, Romania and Ukraine in winters 2017/18–2021/22.

2018 for full details). Morning counts have the advantage that undisturbed geese take off and depart from the roosts for feeding areas in small groups in daylight, which facilitates species identification and accurate counting, especially because larger evening flights to the roost may take place after dark. In sites where experience showed that the roosts could not be covered from one vantage point, counts from two or more were undertaken to ensure good coverage, maintaining communication to minimise

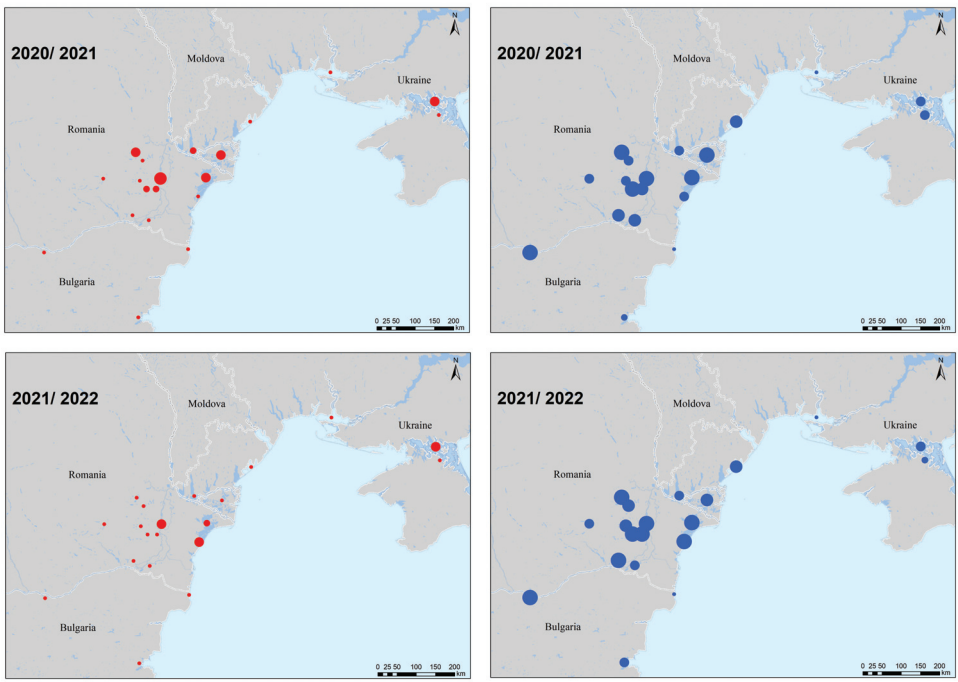

Figure 1 (*continued*).

double counting. It is eminently possible to distinguish GG, GWFG and RBG from each other based on calls, size, body shape, flight speed and behaviour. However, it was less possible to identify rarer species definitively, such as Lesser White-fronted Geese *Anser erythropus*, Western Tundra Bean Goose *A. fabalis rossicus*, Barnacle Goose *Branta leucopsis* and Brent Geese *B. bernicla* during such counts. These species therefore were recorded when encountered, especially when the geese were counted later in fields. None of these species was numerous enough (see Results) to affect the totals significantly. Roost counts were compiled on recording standard information (see Iliev *et al.* 2018 for details) at six European Union Special Protection Areas (SPAs) in Bulgaria, eight SPAs in Romania and 20 large key goose sites in six wintering regions in Ukraine (see Fig. 1 and Supporting Materials Table S1 for details).

Results

Red-breasted Geese

Maximum annual coordinated international counts varied between 16,508 (January 2018) and 26,834 (January 2022, Fig. 2, see also Table S2 for the core counts), and the mean of the five annual maximum counts was 20,919 birds. The highest national counts in all three countries were 22,124 in Bulgaria (in early March 2018), 23,641 in Romania (late January 2022) and 15,561 in Ukraine earlier in January 2022 (Table S2). Highest

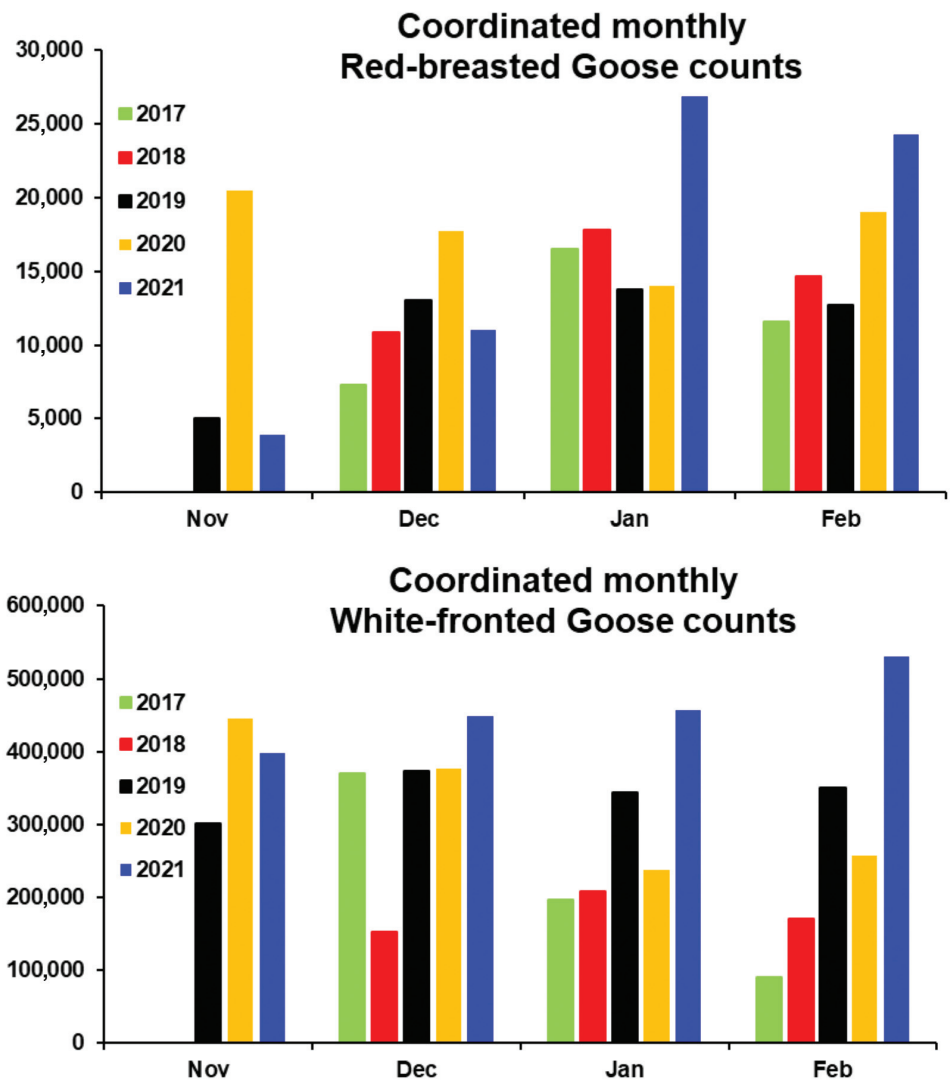

Figure 2. Histograms showing total coordinated monthly counts of Red-breasted Goose (upper) and Greater White-fronted Goose (lower) from Bulgaria, Romania and Ukraine combined for the winters 2017/18–2021/22 inclusive.

numbers occurred in Romania, which contributed 40–92% (overall mean = 66.3%) of the international coordinated counts (except for 27% during the low count in December 2021) and where numbers generally build from November to peak after January, but while the annual distribution was similar (Fig. 1), there remains considerable between-year and seasonal variation in abundance (Fig. 3).

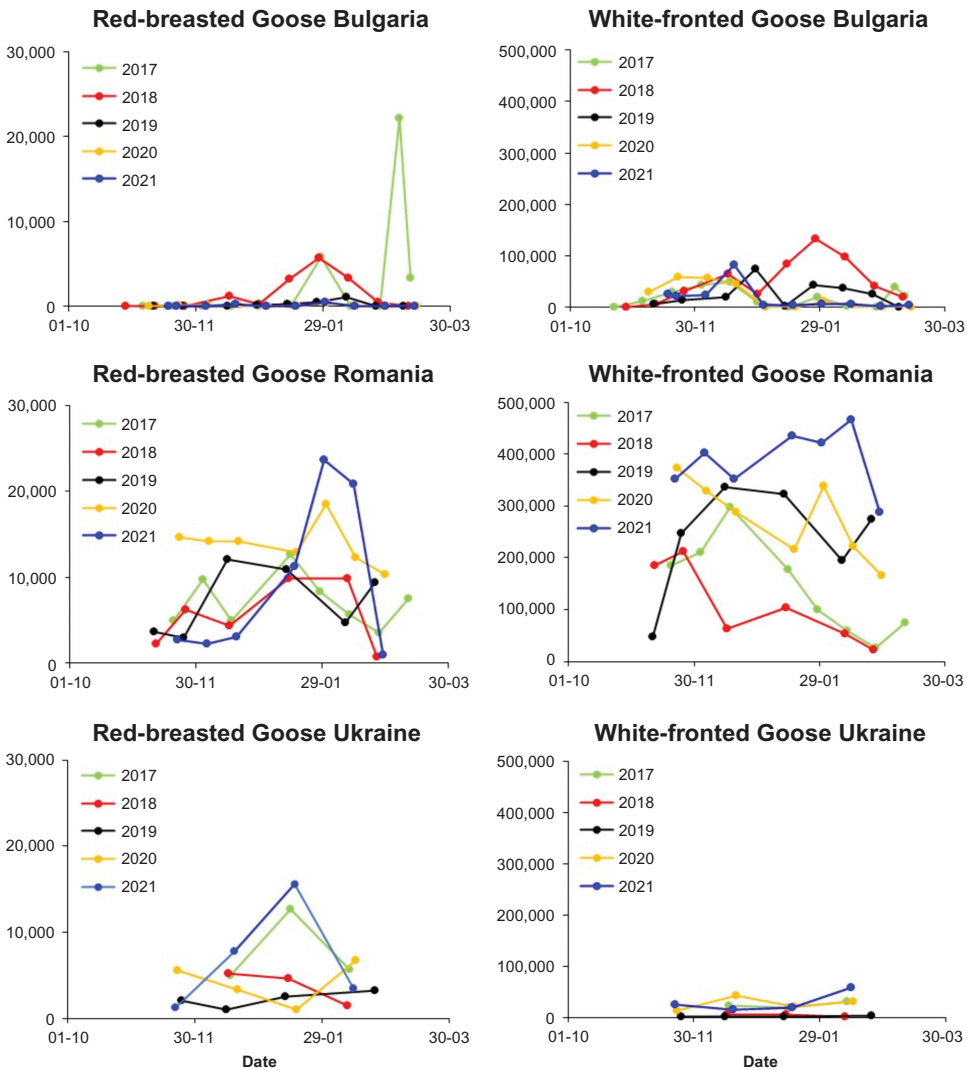

Figure 3. Total national coordinated counts of Red-breasted (left) and Greater White-fronted Geese (right) showing the annual occurrence of both species in Bulgaria, Romania and Ukraine, in winters 2017/18–2021/22 inclusive.

Greater White-fronted Geese

Peak annual coordinated international counts varied between 90,552 (February 2018) and 530,100 (February 2022, Fig. 2 and Table S2), with a mean of 385,363 birds. Peak national counts were 133,612 in Bulgaria (January 2019), 465,950 in Romania (February 2022) and 251,735 in Ukraine (December 2017). Romania also hosted between 65% and 95% of all GWFG (overall mean = 77.3%)

recorded during the international counts, except during winter 2018/2019 (31–50%) when numbers were relatively low and more evenly distributed (Table S2), but when unusually high numbers occurred in Bulgaria from January onwards (Fig. 3). Numbers typically build rapidly through late November, but there was again much variation in the peak counts and within-winter changes in abundance, especially in Romania, although the distribution across winters was similar (Fig. 1).

Greylag and other goose species

Although not fully presented here, the maximum numbers of GG counted increased from 4,059 (during 2017/18) to 13,236 (in January 2021) and 13,951 (in December 2021) respectively (see Table S3 for details). In the five seasons, Romania hosted between 31% (December 2018) and 96% (December 2019) of the totals, in most months in excess of 50%, confirming the country's relative importance, but numbers showed high variations away from the peak counts (see Table S3).

Other species registered included Barnacle Geese and Brent Geese as single individuals, with Western Tundra Bean Geese annually totalling a few tens of birds and Lesser White-fronted Geese occurring in larger numbers (up to 12 seen together) in large GWFG flocks. Despite the difficulty of detecting small numbers of Lesser White-fronted Geese in larger goose flocks, their relatively rare detection rate suggests it is unlikely that more than 200 were present throughout the region in any one winter and that they therefore do not contribute significantly to the totals. Although the absolute numbers are modest, they remain very significant for the region, where the species is otherwise rare.

Discussion

These coordinated counts bring new and up-to-date assessments of the seasonal numbers and distributions of two important goose species wintering in this part of the Black Sea, based on the first standardised internationally coordinated counts of geese which occupy the same roost sites across Bulgaria, Romania and Ukraine. They recorded more than 20,000 RBG regularly present in the region and over half a million GWFG counted on one occasion. These compare with current AEWA CSR9 population estimates of 50,000 RBG and 300,000–400,000 GWFG for the entire Black Sea/Turkish wintering population (Nagy & Langendoen 2020). We should stress that the counts presented here represent minimum counts of the two species in the region concerned. To start with, the aim of the project was to cover all the sites protected as EU SPAs within Bulgaria and Romania, as a means of monitoring their site safeguard effectiveness, whilst recognising that both species also occur elsewhere in both countries along the coastal strip not included in the count programme. However, we are confident that RBG are concentrated almost exclusively in the areas monitored here in Romania and Bulgaria, and that they and GWFG are restricted to roosting on coastal wetlands, as was the case in the late 1990s (Kostadinova & Dereliev 2001). Likewise, in Ukraine, the count network concentrated on the largest and best known of the goose resorts along

the coast, but we fully recognise that both species may be under-counted in that country because of the size of some of the overnight roosts and because many other sites supporting wintering geese were not surveyed during this set of counts. The important take-home message is, however, that carrying out the same census at all 20 sites, using the same methods throughout five successive winters, has produced comparable counts of the numbers of geese of both species using these sites. This forms a basis for examining between- and within-year changes in abundance, now and in the future.

Red-breasted Geese

Traditionally, RBG wintered in the steppe region around the Caspian Sea, especially in the lower Kura River on the Muğan Plain of present day Azerbaijan, but potentially also in Iran (Alphéraky 1905). The RBG was virtually unknown in the Bulgarian part of Dobrodzhagea prior to the late 1960s, but became an increasingly regular wintering species there from the mid- to late 1970s (Ivanov & Pomakov 1983) and similarly was unknown in Romania before 1910, with only *c.* 20 records between then and 1950 (Munteanu *et al.* 1991). The situation seems to have changed in the 1950s due to rapid agricultural development of the Muğan Plain that rapidly removed the winter cereals and replaced them with cotton, which rendered the area unsuitable as a wintering site for these geese. It is thought that this forced the geese to search elsewhere for wintering quarters, with Talpeanu (1963) reporting the species occurring annually in Romania in numbers ranging from tens to hundreds in years immediately prior to his writing. By December 1968, in parallel with the declines in numbers around the Caspian Sea, Johnson & Hafner (1970) reported 25,000 near Istria in Romania, although in subsequent years counts were much lower: 3,750 in winter 1969–70 (Johnson & Hafner 1970), 4,000 in December 1969 (Scott 1970), 9,300 in December 1970 and 6,000 in December 1971 (Johnson & Biber 1971). There were relatively few counts following this until *c.* 1,000 in February 1982, 9,600–12,100 in November 1982, 2,400 in January 1988 and 11,630 in January 1989 (Munteanu *et al.* 1991). In Bulgaria, average mid-winter counts increased from 7,200 during 1977–1981 to 10,400 in 1982–1989 (Michev *et al.* 1983, 1991). Sutherland & Crockford (1993) reported between 23,830 and 33,830 RBG just in Romania in December/January of 1990/91. In Ukraine, between 1,000 and 3,000 were regularly wintering by the early 1990s, rising to 24,000–27,000 in the early 2000s, while national mid-winter counts averaged 4,570 between 2005 and 2017, ranging from zero to 21,199 depending on weather conditions (Andryushchenko *et al.* 2003, 2019).

Surveys carried out away from the winter quarters since the 1990s have regularly reported much higher numbers, for example, 88,000 (1996), 63,200–65,400 (1998), 95,900 (1999), 56,900 (2010) and *c.* 150,000 (2012) staging in northern Kazakhstan (Aarvak *et al.* 1996; Tolvanen & Pynnonen 1998; Tolvanen *et al.* 1999, 2000; Rozenfeld 2011; Rozenfeld *et al.* 2012). However, the consensus in recent years has been of *c.* 60,000 estimated during staging in Kazakhstan (Cuthbert *et al.* 2018). Clearly,

trying to assess population size of avian migrants by counting at staging sites known to be subject to high levels of turnover risks major problems associated with double counting. Although coordinated counts on the core winter quarters in Bulgaria, Romania and Ukraine may underestimate true population size (with birds missed at uncounted sites or because of geese remaining further up the flyway), they have never found the numbers approaching those estimated at staging areas in recent years. As a result of the mid-winter counts from Bulgaria (54,000), Romania (1,400) and Ukraine (500; Iliev & Petkov 2015), Wetlands International increased its global population estimate from *c.* 44,000 to *c.* 56,000 individuals (Wetlands International 2023), confirmed by Cuthbert *et al.* (2018). This was recently revised to 50,000 (Nagy & Langendoen 2020; Wetlands International 2023), but with a high degree of uncertainty attached to the true abundance of the population.

Coordinated winter Black Sea censuses in January 2003, 2004, 2005 and 2006 resulted in total estimates of 33,600, 52,800, 32,100 and *c.* 34,000 individuals respectively (geometric mean = 37,000; BirdLife International 2022). Total counts of 40,800 RBG were made in spring 2008 (primarily because of a large count in Kalmykia; Rozenfeld 2011), 44,300 the following winter (reported by BirdLife International 2022) and 56,000 were counted in Bulgaria, Romania and Ukraine in January 2013 (Iliev & Petkov 2015; BirdLife International 2022). However, counts in Bulgaria, Romania and Ukraine have not exceeded 30,000 since then. Numbers counted in Ukraine in years with good mid-January count coverage (especially the important Syvash area) included 34,810 in January 2001 (a year with low numbers of *c.* 2,700 in Bulgaria; Kostadinova & Dereliev 2001), 12,190 in 2005 and 20,079 in 2007. These were all years in which the January mean temperature was (unusually) well above freezing (Kostiushyn *et al.* 2011; temperature data from https://www.tutiempo.net/clima/ws-339020.html). All these patterns show how rapidly the species shifts between different areas. They also lend further weight to the suggestion that counts in the mid-2000s might have been incomplete because birds wintered away from the traditionally surveyed sites, potentially further east and north during milder weather. Large numbers have been recorded at Manych-Gudilo, Russia, during *ad hoc* surveys in recent winters, and it is suspected that other birds may winter at other, as yet unknown, sites. Yet it is the case that almost none of the now numerous GPS-tagged RBG have been found wintering away from the traditional northwest Black Sea coast resorts, the majority of which have been counted in recent years. There is no doubt that some RBG were likely missed during the counts of recent years presented here, accepting that the species may occur in winter at other uncounted sites along the Ukraine coast and in resorts not counted in southeast Russia or perhaps (but less likely) in the Caspian Sea. Recent satellite tracking data indicates that RBG remain further north along their flyway corridor when mild temperatures permit this. Several tagged geese have remained in southern Russia relatively late in the season, including some remaining until late December (in one case mid-January)

at Veselovskoe Reservoir, Rostov, when generally RBG head to Romania in December. Numbers remaining in Russia are however unlikely to exceed 1,000–3,000 birds, and these areas are usually abandoned by mid-January. Other tagged individuals stayed late in Ukraine (Crimea and Sivash) or simply remained in Romania, coming further south to Bulgaria only when winter cold spells and snowfall forces them to move on. Despite frequent observations of individuals and small groups of up to tens of birds elsewhere in Europe, the Caucasus, Turkey and Iraq, there have never been reports of large concentrations elsewhere.

Greater White-fronted Geese

GWFG have long been known to winter along the northwestern coasts of the Black Sea, especially on Crimea (Alphéraky 1905), but also in Romania, being described by Dombrovski (1912) as passing through in October and November in "incredible masses". More recently, Johnson & Hafner (1970) counted 500,000 between Istria and Sinoie in Romania in December 1968 (with 50,000 still present in January 1969). As was the case for RBG, in following years GWFG counts in Romania were much lower, with 27,000–40,000 in winter 1969/70 (plus several thousands more along the Black Sea coast of Bulgaria); 48,000 and 100,000 in November and December 1970 respectively; and 29,500–34,000 in November 1971 (Johnson & Hafner 1970; Johnson & Biber 1971; Dijksen *et al.* 1973). Munteanu *et al.* (1991) described GWFG as the most numerous of the goose species, arriving from late September until late December in mild years, when 80,000–100,000 (exceptionally up to 500,000) may occur, mainly centred on the Razim-Sinoie section of the coast, with up to 100,000 remaining to winter in most years (occasionally up to 364,000 in winter 1988/89).

In Bulgaria, numbers of wintering GWFG seem to have increased between 1977–1981 and 1982–1989 from an average of 66,100 counted to 145,300, with some expansion of wintering range over the same period (Michev *et al.* 1983, 1991). In Ukraine, during 1985–1993, 400,000–450,000 were counted in winter east of the Dnipro River, with the largest count of 500,000 in December 1997 in the Askania Nova Biosphere Reserve alone, considered the result of unharvested cornfields there and heavy hunting pressure on adjacent lands (Andryushchenko *et al.* 2019). Numbers therefore were considered to be declining from the mid-1990s onwards, with reported total coordinated counts of 145,400 GWFG in January 1995, 193,589 in 1998, and 262,247 in 2001, all relatively mild years, but only 27,950 and 48,434 were reported in the very mild winters of 2005 and 2007 when larger numbers of RBG also remained in the country (Kostiushyn *et al.* 2011, see Table S4 for summarised information from that publication). It is however important to stress that those authors were not able to achieve coverage of western sites in Ukraine for the years from 2002 onwards, which contributed to the between-year variation in January abundance of the species. National mid-winter counts averaged 4,570 between 2005 and 2017, ranging from zero to 21,199 depending on weather conditions (Andryushchenko *et al.* 2003, 2019). The important conclusion seems to be that, after

declines in the 1990, the northwestern coasts of the Black Sea remain an important wintering area for GWFG, apparently supporting up to half a million geese over recent decades. This makes the region of outstanding importance for the species, although we urgently need to understand better the extent of exchange between these wintering birds and those wintering further east into Russia and the Caspian, as well as with birds wintering in Turkey, the eastern Mediterranean and central and northwest Europe.

Greylag Geese

Black Sea wintering GG are thought to originate from breeding areas in Belarus, European Russia, Ukraine, Romania and Bulgaria and, together with Greylags wintering in Turkey and Greece, are considered to belong to a population estimated to number between 25,000 and 50,000 birds (Fox & Leafloor 2018). However, numbers reported here (< 300 counted in Bulgaria, 10,000–25,000 in Romania and < 1,500 in Ukraine) are substantially lower than those reported in Fox & Leafloor (2018, up to 3,000, 10,000–25,000 and 4,000–11,000 respectively). This seems to reflect a considerable decline in wintering numbers since the period from the 1980s until the early 1990s, when an estimated 45,000–55,000 wintered in Azov–Black Sea region (Andryushchenko *et al.* 2019). Clearly, this may be a consequence of GG increasingly wintering away from northwestern coasts of the Black Sea in all three countries and/or a shift in wintering areas to the north and south of our study area. However, these apparently reduced numbers reinforce the need for improved monitoring and a better understanding of the abundance, distribution and status of this GG population that remains poorly studied.

Conclusions and future research

For the time being, we are confident that 16,000–27,000 RBG and up to 530,000 GWFG were counted wintering in the northwestern Black Sea region during our surveys, numbers which are not so very different from the late 1960s for RBG but lower than in recent years, while we know less about the true status of GWFG over the last 60 years. There remains much to be learned about the iconic RBG, not least to confirm the true extent of its winter quarters, which is likely to be more spread out nowadays between the northwestern Black Sea and southwest Russia. We therefore await confirmation of the true RBG population size and its recent trends. Until recently, the global RBG population estimate has been based on coordinated counts from the wintering grounds, which involved no extrapolations, in contrast to more recent estimates from migratory stopover sites that rely on extrapolation and risk double counting due to rapid turnover. There remains much to be done to improve our ability to generate reliable RBG annual estimates of population size and its trend over time, and as a lesser conservation priority, the same is true of GWFG wintering in the area. This requires further annual coordinated counts throughout the entire region.

It is also essential to continue further deployment of tracking devices throughout the range, in order to identify the current

extent of the wintering grounds used by both species and to resolve whether currently unknown winter quarters exist. Data from tracking of individuals would also contribute to determining the rate of turnover at staging sites to help improve the modelling of estimated population size based on counts at such sites. This applies to the GWFG as well as RBG, because although common and abundant in the region, it remains poorly known. To date, limited neck-banding and tag deployment on GWFG has shown exchange of Black Sea-caught individuals with the Pannonic Flyway (Hungary and Austria) and North Sea flyway (Germany and Poland) populations, but this is only the tip of what we do not know. More deployment of tracking devices would greatly help with establishing flyway linkages between breeding, moulting and staging areas, to support the safeguarding of sites and sustainable hunting initiatives, as well as establishing within-winter shifts in range in response to weather conditions, food depletion and changes in land use.

We also remain sadly ignorant of the effect of hunting on all of these goose species throughout the region. The ban on hunting that was introduced in Romania in 2020–2022 may have had an effect on the decisions of geese to remain there in those seasons rather than continue to Bulgaria, but there is no sign of such a response in terms of elevated percentage of the count in Romania in those years compared to the others. The disturbance effects of hunting and the benefit of creating hunting-free areas therefore represent fruitful areas for future research. Wind turbine development is also occurring throughout the region and may present a new threat to the integrity of the goose wintering areas, which also needs to be taken into account for goose conservation management.

For these reasons, we would urge the continued coordinated monitoring of these two species throughout the area reported here, although recognising the impossible problems faced by Ukraine since the invasion of Crimea in 2014 and with the war currently ongoing in the region. All wintering areas in that country are now in the frontline, so it is impossible to conduct any adequate monitoring there at the time of writing. Despite this, we are presently aware that there were 20,000–25,000 RBG and over 100,000 GWFG on the Sivash Lake in late February 2023. We can only hope for a rapid resolution and the resumption of counts to assess the potential degree of damage caused to these species and other waterbirds, as well as to their wetland habitats, because of the conflict.

Acknowledgements

We gratefully acknowledge the support of EU LIFE funding under the "Conservation of the Red-breasted Goose along the Global Flyway" project (LIFE16/NAT/BG000847). We are particularly grateful to the regional count coordinators Vladimir Mladenov, Iordan Hristov and Svilen Cheshmedzhiev, and to all the volunteers, without whose participation it would have been impossible to achieve the results presented here. In Bulgaria: Ivailo Ivanov, Valentin Katrandzhiev, Petar Iankov, Christopher Day, Dimitar Rusev, Dyan Boev, Galabin Asenov, Hristiyan Hristov, Ivailo Dimchev, Milen Dimitrov, Mirela

Todorova, Nelly Raicheva, Petar Manolov, Radoslav Moldovanski, Ralitsa Georgieva, Samuil Dobrev, Stoyan Nikolov, Ventsislav Panev, Yanitsa Todorova and Zdenek Hill. In Romania: Ajder Vitalie, Alexandru-Iulian Ifrim, Ciprian Fantana, Cornel Dima, Cristian Sandu, Dan Bandacu, Dani Dragan, Daniel Petrescu, Dorin Damoc, Elena Bolboaca, Emanuel Baltag, Eugen Bolboaca Lucian, Eugen Petrescu, Florin Stavarache, Ioana Curut, Ion Costin, Jozsef Szabó, Lajos Pal, Laszlo Ambrus, Laurentiu Petrescu, Lucian Fasola-Matasaru, Marius Dima, Nandor Veres-Szászka, Paul Tibu, Sebastian Bugariu, Veres-Szászka Judit, Viorel Cuzic, Viorel Gavril and Vlad Amarghioalei. In Ukraine: Irina Yakovleva, Irina Vikhristyuk, Konstantin Redinov, Maxim Yakovlev, Olexandr Hrinchenko, Oleksandr Gaydash, Oleksandr Nastachenko, Oleksandr Rula, Roman Rusev and Zenoviy Petrovich. Thanks also to Chris Spray and two anonymous reviewers for suggestions that improved an earlier manuscript.

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Photograph: Flock of Red-breasted Geese and Greater White-fronted Geese in flight in Bulgaria, by Nicky Petkov/naturephotos.eu.