Blackcaps wintering in Wales, 1999/2000 – 2020/21

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Crynodeb

Cynyddodd nifer y Teloriaid Penddu sy'n gaeafu yng Nghymru yn ystod ail hanner yr 20fed ganrif, ond heblaw mapiau o bresenoldeb a niferoedd cymharol yn Bird Atlas 2007-11, ychydig sydd wedi ei gyhoeddi sy'n asesu eu statws. Mae'r papur yma yn defnyddio data o nifer o ffynonellau i ddisgrifio'r hyn a wyddom am ddefnydd o erddi a thueddiadau mewn niferoedd Teloriaid Penddu fu'n gaeafu yng Nghymru yn ystod y 21ain ganrif, ac yn ceisio asesu maint y boblogaeth.

Abstract

The presence of Blackcaps wintering in Wales increased during the second half of the 20th century, but aside from the maps of cumulative occupation and relative abundance in Bird Atlas 2007-11, little has been published that assesses their status. This paper uses data from multiple sources to describe what is known about garden-use, trends in numbers of wintering Blackcaps in Wales during the 21st century and attempts to assess the size of the population.

Introduction

As a breeding species, Blackcap *Sylvia atricapilla* is widespread in Wales, and has increased significantly in abundance during the last 50 years. Territory density in broadleaved woodlands in Wales increased by 57% between 1965-72 and 2003-04 (Amar *et al*. 2006) and the BBS index for Wales increased by 143% between 1995 and 2018 (Harris *et al*. 2020). As elsewhere in Britain and Ireland, the breeding population migrates to the south and is replaced by a far smaller wintering population from Europe.

Summering Blackcaps sometimes stay beyond late October, but such occurrence was significantly unusual to be noted by early authors, such as one being "pugnacious" to other birds in a Porthmadog garden in January 1906 (Forrest 1919). Blackcaps were noticed in Welsh gardens during the winter with increasing regularity in the 1960s, initially in southeast Wales (e.g. Hurford and Lansdown 1995), but more widely by the 1980s when the first spatial information became available. The species occurred in 30% of 10-km squares in Wales, scattered around the lowlands, during the four winters of the Britain and Ireland Winter Atlas 1981-84 (Lack 1986).

Orientation studies of Blackcaps captured during the summer in central Europe found that birds showed a strong tendency to move to the north-west corner of their aviary in autumn, leading Berthold (1992) to hypothesise that this was the source of the increasing numbers of Blackcaps wintering in Britain. Blackcaps caught in Somerset during the winter and translocated to aviaries near Lake Constance on the Swiss/German border produced young that, in their first autumn, showed the same directional tendency, demonstrating that this was likely to be the result of a genetic change that had occurred in just a couple of dozen generations. Berthold and Pulido (1994) subsequently proved that the direction of travel was set by the birds' genes: the first birds to make the journey, perhaps by accident, returned to their breeding areas earlier in spring than those that had migrated to the south, so the 'north-western' birds paired up with each other and thus the genetic selection

for migration to Britain and Ireland was strengthened.

The trait for wintering in Britain is not restricted to the area of the original southern German studies, but extends from north-east Spain through France and central Europe as far as the Polish border with Ukraine, a distance of over 2,000km. British-wintering Blackcaps arrive back in their European breeding area, on average, 10 days earlier than those that migrate south (Delmore *et al*. 2020).

Garden bird feeding in Britain has provided favourable conditions to aid the overwinter survival of these migrants from mainland Europe, particularly in the second part of the winter, when the autumn berry crop is exhausted and invertebrates are in short supply. Blackcaps were recorded more often in UK gardens that provided food more frequently, and this association with supplementary feeding increased between 1999/2000 and 2010/11 (Plummer *et al*. 2015). A survey found that 70% of Blackcaps wintering in gardens fed on fat-based foods, such as suet balls, and 35% on sunflower seeds (BTO 2013).

Methods

Data from five surveys were used in this review. Each has a different purpose but, in the absence of a dedicated survey, together they describe the occurrence of wintering Blackcaps in Wales. The data used are from December, January and February unless otherwise stated as it can be assumed that Blackcaps here during December-February are almost exclusively visitors from Europe. Blackcaps arrive in Britain from mainland Europe from mid-September, with the bulk of arrivals in mid-October (Ozarowska 2012). Records from Skokholm and Bardsey bird observatories indicate that most movement by Blackcaps has ceased by early November and resumes from mid-March (Pritchard *et al*. 2021).

Bird Atlas 2007-11 (Balmer et al. 2013)

The most complete assessment of the distribution of Blackcap can be derived from the two winter Atlases of Britain and Ireland (Lack 1986, Balmer *et al*. 2013). These provide robust evidence of the spatial distribution at scale of 10-km squares (hectads) for the months November-February.

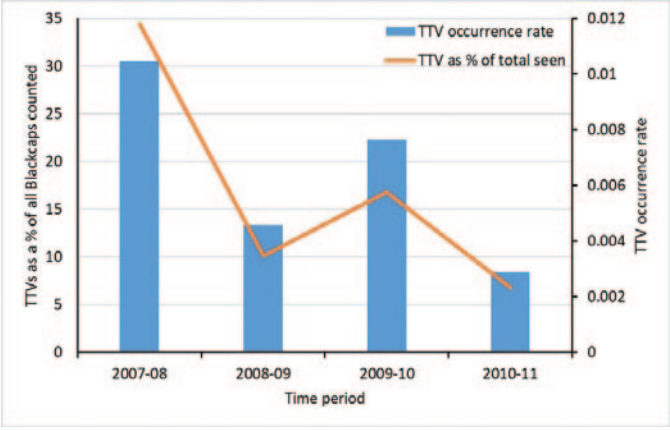


Figure 1. Blackcaps recorded on Timed Tetrad Visits in Wales in each winter of Bird Atlas 2007-11 as a proportion of all Blackcaps seen during each winter. The secondary y-axis (TTV occurrence rate) is the mean number of individual Blackcaps from two visits divided by the total effort (number of tetrads surveyed).

During the Atlas, Timed Tetrad Visits (TTV) were undertaken in a minimum of eight of the 25 tetrads in each 10-km square in order to estimate relative abundance. For Blackcap, these were shown at a 20-km square level in the Atlas, based on the mean number of TTVs in which the species was recorded annually over the four winters (**https://app.bto.org/mapstore/StoreServlet**). The Atlas data do not estimate the density of occurrence as the TTVs surveyed may not reflect the distribution of a species' habitat. In suburban areas, in particular, Blackcaps may not have been visible to surveyors within enclosed gardens.

TTV effort was not equal across the four winters: almost one third (32.4%) of all tetrads surveyed in Wales were completed in 2007/08, with 23.0%, 22.2% and 22.4% completed in the successive three winters. While the number of Blackcaps recorded during each year of the Atlas was very similar (see results), the variable TTV effort has been accounted for by generating a Blackcap occurrence rate and assessing the proportion of the total that came from TTVs (fig.1).

The occurrence maps in Bird Atlas 2007-11 also used casual records collected in BirdTrack, by BTO Garden Birdwatch, bird clubs and the ringing scheme, but only TTV data were used to calculate relative abundance. All tetrad data collected was made available to us by the BTO and for this analysis, a minimum number of Blackcaps reported in each tetrad was calculated by using the highest count in each of the four winter periods from any source. We used November records, as well as December-February. Approximately 18% of 10-km squares occupied during the four winters of the Atlas reported the species only in November.

BTO Garden BirdWatch

Garden BirdWatch (GBW) is designed to find out how and when birds and other animals use gardens. Subscribers submit weekly lists of garden birds and other wildlife (**bto.org/our-science/projects/gbw**) and many submit records for a number of consecutive years. During 2000-20, the number of gardens participating in Wales declined consistently from a peak of 587 in 2003 to 343 in 2019. There was a surge in participation (to 679 gardens) in 2020, which occurred after April when the scheme was made free during the COVID-19 lockdown, and is unlikely to have affected the results in December 2019-February 2020. Some increased participation continued into 2021, when records were submitted from a maximum of 456 Welsh gardens in January/February (mean 2000-21=466) (fig.2). Although the sample size is small compared to the other data sources, the GBW provided the most robust trend information for Wales, since counts were collected consistently across a broadly similar suite of gardens. Trends in reporting rate and the mean number of Blackcaps per garden can be computed.

The GBW is less useful for estimating population size across Wales, however. Participants have a high level of interest in their garden birds, and almost all provide supplementary food, compared to an estimated 64% of households in the wider population (Davies *et al*. 2012). It is uncertain how representative participants' gardens are compared to the rest of Wales. Numerically, gardens in the local authority areas of Powys, Cardiff, Carmarthenshire, Ceredigion and Pembrokeshire are the top five contributors of records to GBW, whereas the South Wales valleys in particular are under-represented in relation to the potential number of households. Research in England and Scotland has shown that house type, household size and the age of the head of the household are important predictors of bird feeding (Davies *et al*. 2012) and this is important when considering the population of a bird that makes considerable use of supplementary feeding.

RSPB Big Garden Birdwatch

This mass participation survey has been undertaken on the last weekend of January almost every

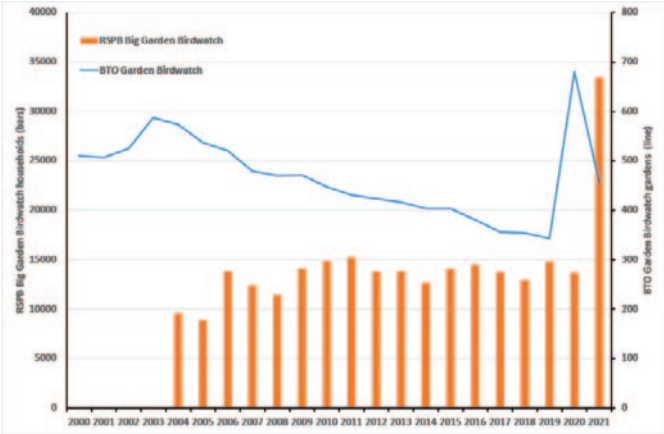


Figure 2. Number of contributors to RSPB Big Garden Birdwatch and BTO Garden BirdWatch in Wales. Note the increase in BTO contributors in 2020 occurred after April, so does not reflect the previous winter period. Those for 2021 relate only to January and February.

year since 1979. Initially a project for young people, organised by the Young Ornithologists' Club, its adoption as a public engagement tool for a wider audience, with a web portal capable of capturing the large number of records, has encouraged a greater number of people to participate (fig.2). Data from the Big Garden Birdwatch (BGBW) were available for Wales from 2004 onwards.

The survey provided a snapshot of birds present in participants' gardens (or a local greenspace) during one hour on one weekend of the year, so was more prone to variable results than the BTO Garden BirdWatch, as a result of the weather and the experience of participants. However, the mass appeal of the RSPB survey resulted in a participation rate (number of gardens) in Wales that was more than 30 times higher than the BTO survey. It also included a greater variety of garden-types and spatial distribution of locations (mean=14,323 gardens during 2004-21). More Blackcaps were recorded in this survey than in any other used in this review.

BirdTrack

The online BirdTrack portal is a partnership between the BTO, the RSPB, Birdwatch Ireland, the Scottish Ornithologists' Club and the Welsh Ornithological Society. It provides a platform for observers to manage their bird records, which can be analysed collectively to look at migration movements and distributions of birds throughout Britain and Ireland. The scheme is year-round and encourages the recording of timed Complete Lists. The proportion of Complete Lists containing a given species provides a measure of frequency of occurrence over time, but the habitats in which these lists are collected are not representative (e.g. Boersch-Supan and Robinson, In prep.).

Participation grew steadily from the late 1990s, and during 2016-20, more than 400,000 records were submitted annually in Wales. Complete Lists averaged 18,375 each year. For this analysis, only records from winters (December-February) in 2011/12 to 2020/21 were used, since these were the years of greatest participation, accounting for 79.2% of all records submitted since 2000.

In the context of this review, BirdTrack was a medium-participation source: more people contributed than to the BTO Garden BirdWatch, but fewer than the RSPB Big Garden Birdwatch. Regular

contributors tended to be active birdwatchers, visiting a wide range of sites and were not restricted solely to gardens. This provided a measure of the proportion of Blackcaps that occur in gardens, to provide context to the other sources.

This analysis used all Welsh Blackcap records for the winter periods 2011/12 to 2020/21. Where a species was recorded only as 'present', this was considered to be a single bird, as a minimum. There were 1,798 records from 748 locations, but after sorting by grid reference, it was clear that many records related to multiple observance of the same individual Blackcaps at a regular location, such as the observer's garden, during the same winter. Following de-duplication, and allowing for the fact that in some gardens different birds were present during the same winter, the dataset consisted of 660 individual Blackcaps at 467 locations.

North Wales 2021 records

An inquiry was undertaken by TC during January 2021, requesting records through four Facebook wildlife groups in North Wales that were followed by 13,800 users, and supplemented by reports from a local WhatsApp group and solicited from a regional daily newspaper. North Wales was defined as the vice-counties of Meirionnydd, Caernarfonshire, Anglesey, Denbighshire and Flintshire adopted by the Welsh Ornithological Society. Details recorded were location, number of Blackcaps and whether the birds were male or female/second calendar-year type. A total of 155 records was received, involving 254 individuals. The inquiry did not request null records and since an unknown number of users belonged to more than one Facebook group and some lived outside the region, it was not possible to assess the reporting rate. Participation was self-selecting, as were all the other datasets used in this review with the exception of Atlas TTVs. The distribution map produced should be regarded as a minimum, as people living in apparently unoccupied squares may not have been aware that the survey was taking place and, unlike the Atlas, no effort was made to record Blackcaps in squares selected at random.

The inquiry (TC pers comm.) incorporated records from BirdTrack, but these were removed in this analysis in order to avoid duplication. In fact, only six records were removed, which illustrated that this crowd-sourcing method resulted in far more records than would have been evident from BirdTrack in the same period.

Results

Distribution of wintering Blackcap in Wales

Bird Atlas 2007-11 (Balmer *et al*. 2013) recorded Blackcap during November-February in 121 10-km squares in Wales, 46.2% of the total available. This represented a 62% increase in the number of 10-km squares occupied in 1981-84 (Lack 1986), although this was lower than the 77% increase that occurred in Britain and Ireland as a whole. In Wales, increases occurred across all lowland areas, although at a slightly higher rate south of the Dyfi estuary than to the north.

However, the mean number of 10-km squares occupied by Blackcap during November-February in any one of those four winters was 58 (55-60), 48% of the cumulative total. Of the 121 10-km squares in which Blackcap was recorded during winters 2007/08-2010/11, the species occurred in only 18 (14.9%) in all four winters, in 32 (26%) squares in three or four winters, and in 62 (51%) squares in two or more winters. Thus, the occupancy maps in Bird Atlas 2007-11 exaggerated the presence of Blackcaps in any one winter during that period by about double.

In the Atlas, the vast majority of occupied squares were below 300m altitude and were primarily along the coast, although some higher elevation squares in south-east Wales were occupied. Relative

to the rest of Wales, there were fewest in Ceredigion, Radnorshire, Montgomeryshire, Meirionnydd, and in Caernarfonshire away from the north coast. Abundance in Wales was lower, relative to similar latitudes in England and Ireland, reflecting the influence of altitude on the likelihood of occupancy. The increase since 1981-84 is illustrated by the only winter atlas undertaken at a tetrad level in Wales, in East Glamorgan in 2007-11 (Glamorgan Bird Club 2014). There, the number of occupied 10-km squares increased from seven (41%) in 1981-84 to 14 (82%) in 2007-11. In the latter period, 14% of tetrads were occupied, but there was a distinct difference between the north and south (separated at latitude 51°35′49″ N, broadly a line running east from the southern edge of Maesteg to the northern edge of Caerphilly). Only 3.8% of the 158 tetrads north of this line were occupied compared to 12% of the 409 tetrads to the south. Concentrations were evident around the suburbs of Cardiff, Barry, Caerphilly and Porthcawl.

Locations of sites with records collected in the North Wales January 2021 inquiry were mapped (TC, pers. comm.) and the distribution by 10-km square compared to Bird Atlas 2007-11 (fig.3). The number of squares occupied in each of the four winters of the Atlas was 17, 12, 14 and 14, and collectively across the four years Blackcap was present in 35 of the region's 96 10-km squares. In January 2021, In January 2021, Blackcap was recorded in 37 of the 10-km squares in North Wales, more than the four winters of the Atlas cumulatively. The methods and effort were very different, so the results are not comparable, but this suggests either that Blackcaps were far more widespread in 2021 or that the 2007-11 Atlas results greatly under-represented the true presence of the species, especially in gardens.

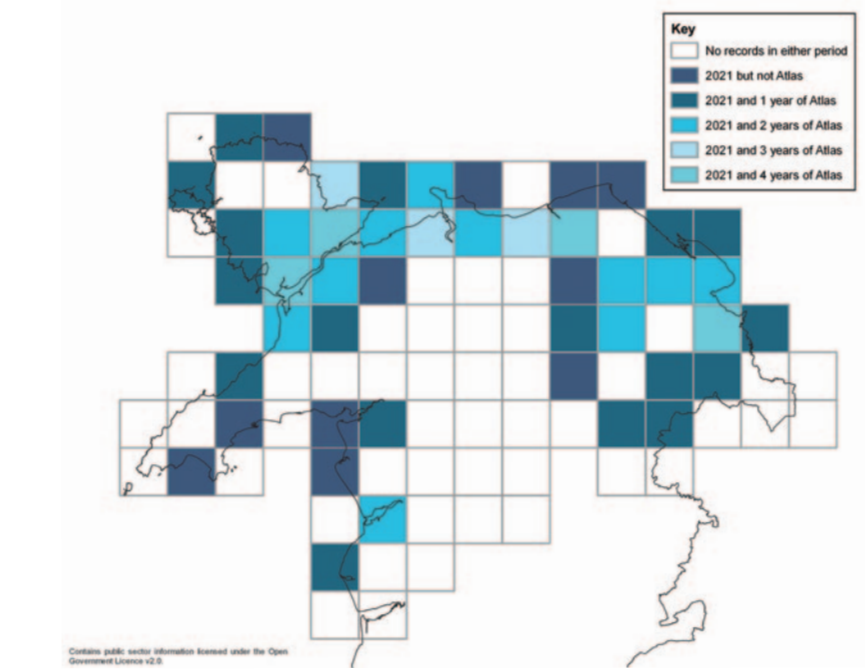


Figure 3. Occurrence of Blackcap in North Wales by 10-km square. Outline square = one or more winter periods in 2007-11 but not January 2021. Black = January 2021 only. Shades of blue = January 2021 and one winter, two/three/four winters during 2007/11.

Using the data for all four Atlas winters and January 2021, Blackcap occurred in 46 of the 96 (48%) available squares in North Wales across both periods. Of the nine squares occupied in 2007-11 but not 2021, one (SH68) on Anglesey contains only a small amount of land, two in south Denbighshire (SJ13 and SJ24) contain very little human habitation and two (SJ37 and SJ45) are on the English border, with less than 20% of the square in Wales.

Finally, the elevation and distance from open coastline of all records (n=465) with sufficient resolution from BirdTrack and the North Wales Inquiry were analysed. The vast majority (86%) of records were within 10km of the coast and 9% were in a band 10-20km away. The remaining 5% were 20-60km from the coast, and none was more than 60km away. Welsh Blackcap records in winter were predominantly lowland: 82% below 100m asl, and all bar two records (0.4%) were below 300m.

Use of gardens by Blackcaps

The records in Bird Atlas 2007-11 did not distinguish between those seen in gardens and those from the wider countryside. The BTO Garden BirdWatch records Blackcaps solely in gardens, and those submitted to the RSPB Big Garden Birdwatch are primarily in gardens. Although the North Wales Inquiry in January 2021 did not request information about habitat type, since it was undertaken during a period of COVID-19 lockdown, which prohibited exercise that did not start and finish at home, it is assumed that the vast majority of records were from the contributors' own garden or in a residential area.

BirdTrack records can provide some indication of the proportion of Blackcaps in gardens, although there is an inherent bias if users are more likely to include a Blackcap record in their own garden outwith a list. All Blackcap records from winters 2011/12-2020/21 were sorted by grid reference and de-duplicated to ensure that each location was recorded only once. Each location was attributed to a Garden based on the description of the location, a specific address or where birds were noted attending a feeder. Sites were attributed as Non-garden if the site description was clearly not a garden (e.g. urban park, university campus, nature reserve or a rural location). The remainder, where there was any uncertainty (such as where the grid reference was of low resolution), were listed as Unknown.

Of 311 locations that recorded Blackcaps during this period, 27 were excluded from the analysis as Unknown. Of the 284 where there was sufficient information to determine the type of site, 70.4% were Gardens and 29.6% were Non-gardens.

Frequency of occurrence

BirdTrack data was used to assess the number of years during 2011/12-2020/21 in which a Blackcap was recorded at the same location (fig.4). Of the 311 locations, 75% recorded Blackcap only once, 23% in 2-4 years and 2% in five or more years. The recurrence rate (2+ years) was similar at sites classed as Gardens (29% of garden records), Non-gardens (31%) and the Unknown types (27%). Only three locations recorded Blackcap in more than five years. These were all in the same area: in nine of the 10 years in Magor and Undy, Gwent (in adjacent 1-km squares) and in six of the 10 years in tetrad ST48I, which comprises both Magor and Undy.

Density of Blackcaps

The mean count of Blackcaps in each record was very similar in both the 10 years of BirdTrack data (1.25/record) and the RSPB Big Garden Birdwatch (1.21/record), with very similar levels in each year of both schemes, except the RSPB survey in 2012/13, which was markedly lower (fig.5). The mean count per site in the North Wales Inquiry in January 2021 was higher (1.64/record), but this may be

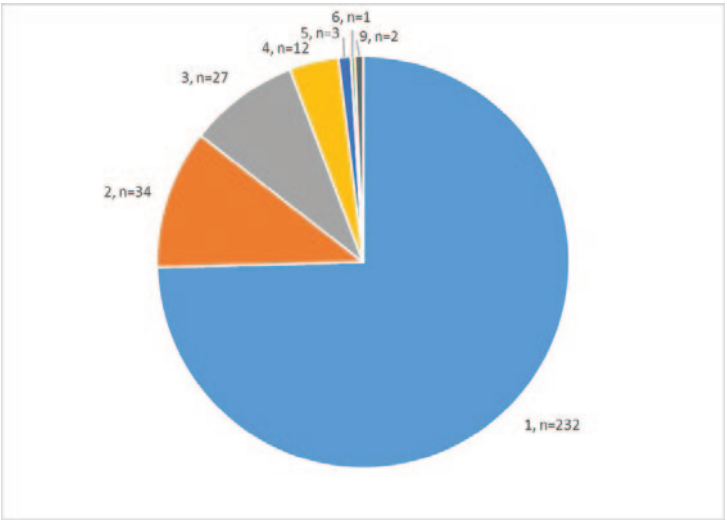


Figure 4. Occurrence of Blackcap in same location in consecutive years, recorded on BirdTrack (labels show the number of years, e.g. 1, and the number of locations n).

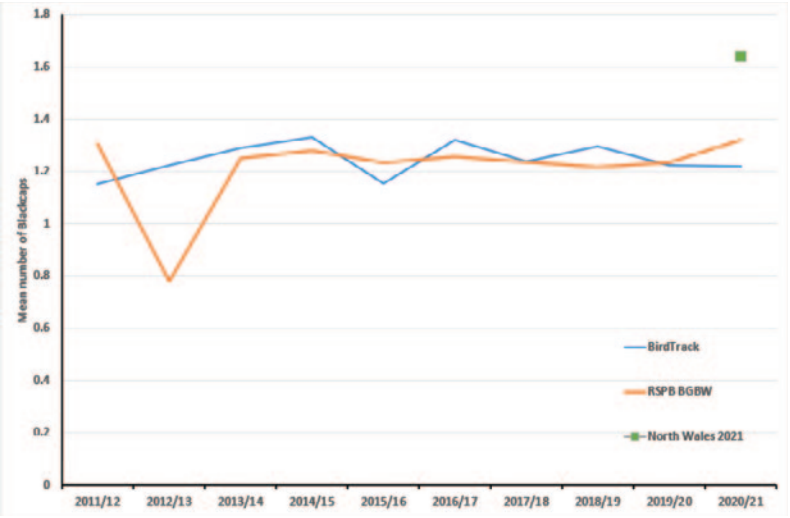


Figure 5. Mean number of Blackcaps per location from records in BirdTrack, RSPB Big Garden Birdwatch and the North Wales Inquiry 2021.

because only the maximum count for the whole month was reported for each site.

In 96 10-km squares in North Wales, the 2021 Inquiry recorded 254 Blackcaps, 2.65 individuals/square. In the same area during the 2007-11 Atlas, combining both TTV and casual records (and assuming that where no count was submitted for the latter, a minimum of one bird was present),

the average number of birds recorded each winter was 33.3 (28-37), which equates to 0.34 individuals/square (0.29-0.39). The proportion of 10-km squares with no Blackcaps was similar in both periods (63% in 2007/08-2010/11, 59% in 2021), but there were far more counts of three or more individuals in a 10-km square in 2021 (21%) than in the best year in each square during 2007/08-2010/11 (7%) (fig.6). The only square in 2007/08-2010/11 with more than 10 Blackcaps was SJ35 (Wrexham North), which contained 12 birds, whereas in January 2021 nine 10-km squares held more than 10 individuals: three in the Dee Valley between Froncysyllte (Denbighshire) and Connah's Quay (Flintshire) and six running east from south-west Anglesey to Rhyl and Prestatyn (Denbighshire). The results from the Atlas and the 2021 Inquiry are not comparable because of very different methods of data collection, but there was far greater effort during the Atlas than in the 2021 inquiry, and so it seems likely that the increased occurrence in 2021 was genuine.

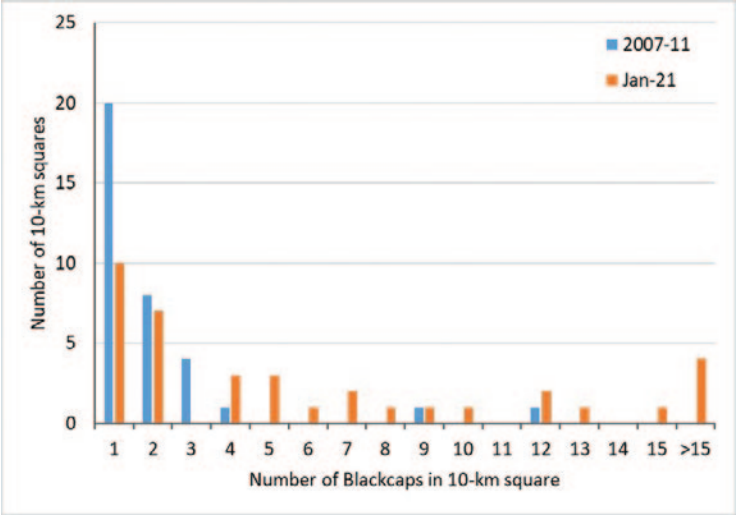


Figure 6. Numbers of 10-km squares in North Wales in which Blackcaps occurred. Blue = during the winter of highest count during 2007-11. Orange = counted in January 2021. Zero counts are excluded (n=60 in 2007/08-2010/11, n=57 in Jan. 2021).

Timing of visits to gardens

In the 22 winter periods between 1999/2000 and 2020/21, the reporting rate of Blackcap in the BTO Garden BirdWatch was highest in January in 10 years, in February in 11 years and jointly between the two in the remaining year.

The GBW reporting rate was higher in some winters than others (fig.7), notably in 2009/10, 2010/11 and 2020/21 when the winter contained periods of cold and/or snowy conditions. That suggests that there is a wintering population of Blackcaps outside gardens that are attracted to supplementary food only when the weather makes feeding on natural sources more difficult. Alternatively, wintering Blackcaps from northern and eastern Europe may move into Wales during bad weather. However, with the exception of the Low Countries, almost all of Europe's wintering Blackcaps are to the south of Britain (**eurobirdportal.org**) and there is no evidence from ringing schemes that such movement occurs within a winter.

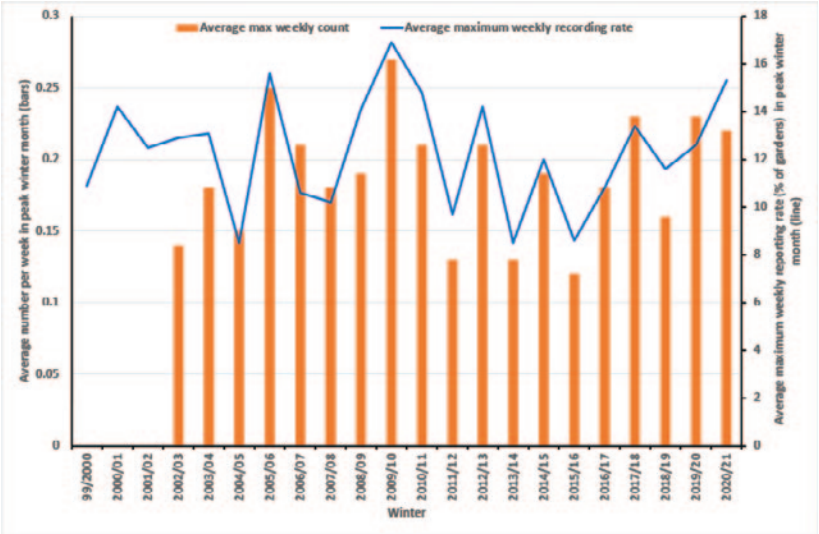


Figure 7. Blackcap occurrence in gardens participating in BTO Garden BirdWatch, 1999/2000-2020/21. Data downloaded from **bto.org/our-science/projects/gbw/results/long-term-patterns** in March 2021.

The GBW reporting rate in March is always lower than in the two preceding months, although it was higher in March 2018 relative to the same month in other years, suggesting that two periods of anticyclonic weather in late February ('the Beast from the East') and mid-March, Blackcaps remained in gardens rather than depart for breeding areas in central Europe.

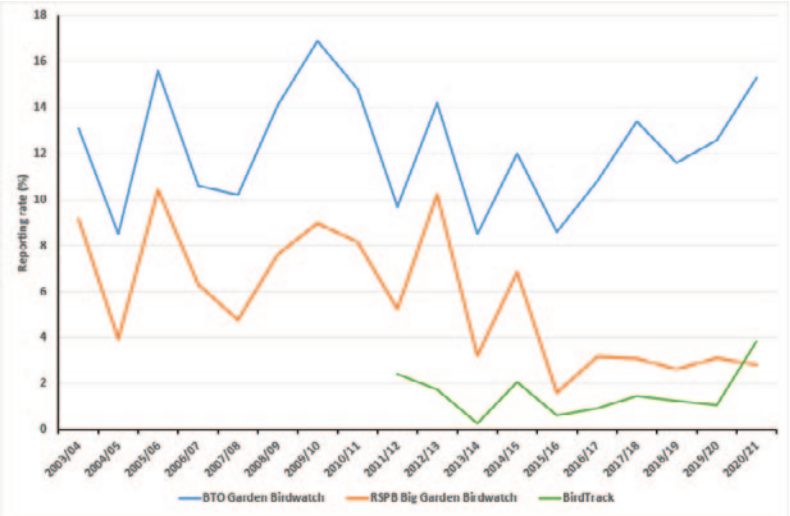


Figure 8. Blackcap reporting rate in gardens participating in BTO Garden BirdWatch and RSPB Big Garden Birdwatch, and as a proportion of lists submitted to BirdTrack in December-February.

Trends in wintering Blackcap numbers

The BTO Garden BirdWatch provided the most robust evidence of the trend in use of gardens by Blackcaps. The mean reporting rate in the peak month across the 22 winters was 12.3%, with no significant trend over time (fig.8). The trend in reporting rate shown by the RSPB Big Garden Birdwatch was broadly aligned to that of the BTO Garden Birdwatch during 2003/04-2016/17, although the actual reporting rate was, on average, 48.5% lower. This is not surprising, since recording effort was far greater in the BTO survey and covers the whole winter period. Since 2017/18, the reporting rate by the RSPB BGBW has been far lower (77.8%) than that of the BTO GBW. It is not apparent what accounts for this, which is not a product of a significant change in the number of participants in either survey until 2021.

The proportion of BirdTrack lists that included Blackcap during 2011/12 to 2020/21 was 1.5% of lists submitted, but varied between 0.3% and 3.8% of lists. The reporting rate is, as would be expected for a non-structured survey in which recording occurred in habitats that are unsuitable for Blackcaps, lower than the two garden-based projects.

The reporting rate for BirdTrack and BTO GBW indicated that, while the number of Blackcaps overwintering in Wales varies between years, the trend has been stable. The minimum number of Blackcaps recorded during Bird Atlas 2007-11 was also consistent across the four winters (122, 128, 125, 117), although the proportion of TTVs counted was much lower in the second, third and fourth years than the first.

This stable situation comes after four decades of growth assessed from both *ad hoc* records and the Atlases, suggesting that much of the expansion in range following the 1981-84 Winter Atlas was before 2000.

Estimating the number of Blackcaps wintering in Wales

The Avian Population Estimates Panel has not made an estimate of the wintering population of Blackcaps for Britain or the UK, including in its most recent report (Woodward *et al*. 2020), so there is no baseline from which to make a Welsh population estimate as has been done for many breeding species in Wales (Hughes *et al*. 2020). Approximately 13% (10.1-16.0%) of Blackcaps recorded on all TTVs in Britain during Bird Atlas 2007-11 occurred in Wales, so if APEP was ever to make an estimate for Britain, it would be straightforward to extrapolate from that.

None of the data sources available generate counts or estimates of density from which a population size can be estimated with confidence. However, two sources may provide the basis of a guesstimate.

a. North Wales 2021 Inquiry

A total of 254 Blackcaps was recorded in North Wales in 2021, a mean of 2.64 per 10-km square in the region. Simply extrapolating this across the 262 10-km squares in Wales suggests a total of 692 individuals or, based on the counties in this survey representing 29.7% of Wales' land surface area, a total of 855 individuals. However, since relative abundance in the Bird Atlas 2007-11 was higher in the south than the north of Wales, and a greater proportion of the latter lies above 300m where Blackcaps occur rarely in winter, this is certainly an underestimate.

An alternative approach, since there is a strong association of wintering Blackcaps with gardens, is to use data on housing stock (Welsh Government 2020). The six local authorities that cover the five North Wales vice-counties account for 325,100 of the 1.413 million properties in Wales (23%), so by extrapolation, an inquiry of this type applied to the whole of Wales should have found 1,104

individuals in January 2021.

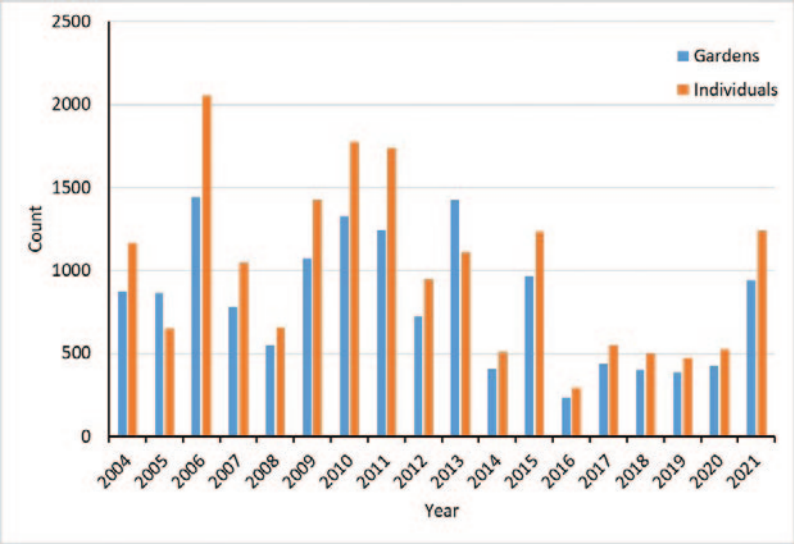


Figure 9. Blackcaps recorded in Wales and the number of gardens recording Blackcap during RSPB Big Garden Birdwatch.

b. RSPB Big Garden Birdwatch

The number of gardens in which Blackcap was recorded was multiplied by the mean number seen in each garden to produce the number of individuals in each year (fig.9). This shows considerable variation, as expected for the reasons described above, between 288 in 2016 and 2,054 in 2006 (mean=994).

Discussion

This review used multiple sources to suggest that 54-70% of wintering Blackcap records in Wales occur in gardens, even though gardens constituted only 1.7% of UK land surface area (Buck 2016; no data is available for Wales). Occurrence in gardens is highest in January and February, and numbers increased during periods of cold weather, suggestive that the population is more widespread across the countryside until pushed into gardens to find a more reliable source of food. In 10 of the 21 years of BTO Garden BirdWatch data assessed, the highest reporting rate of the year was later than the winter months, generally in April. That was the case in every year during 2012-20 compared to just one year during 2000-11, which suggested that a further change may be underway: either wintering birds are staying later (unlikely given the evidence of dates of return to breeding grounds; Delmore *et al*. 2020), or Welsh breeding individuals wintering in the Mediterranean are making greater use of gardens, at least on arrival.

Blackcaps are more likely to be recorded in gardens than non-garden habitats, but only infrequently recur in the same gardens in successive years. Only 1% of BirdTrack locations that recorded Blackcaps did so in at least five of the 10 years. The average lifespan of a Blackcap is two years, so it is possible that individuals return to the same gardens in successive years. However, if Blackcaps gravitate

towards gardens because they provide suitable food resources, it is likely that multiple generations are involved. It would be fascinating to know whether the young of wintering birds visit the same sites as their parents before them.

The mean number of Blackcaps at a given location on any one day (BirdTrack and RSPB Big Garden Birdwatch) has consistently been 1.2-1.3 individuals over the last 10 years, indicative that the population is stable. In the North Wales Inquiry in January 2021, 61% of reports were of full-grown males (TC, pers. comm.), which suggests either that males are more obvious to observers, by their behaviour or plumage, or there is a differential migration between sexes among the mainland European breeding population that winters in Britain. Although, only 1-2 individuals may have been seen in a garden at once, ringing effort in gardens shows that turnover can be higher across a winter. For example, in winter 1984/85, when the population was almost certainly lower than today, 11 Blackcaps were ringed in a garden in Bangor (Caernarfonshire) (Pritchard 2017). Therefore, the numbers involved in any survey or inquiry are likely to be minima.

Blackcaps remain a species found almost exclusively below 300m altitude in Wales, primarily along the coastal plains of North and South Wales which have the highest levels of human habitation. Based on a comparison of distribution in North Wales in each of the four winters 2007/08-2010/11 and a snapshot in 2021, Blackcap was at least 2.2 times more widely distributed than during the earlier period.

The far greater numbers reported to TC's January 2021 Inquiry in North Wales (254 birds) than were reported from these counties to BirdTrack (6 birds) in the same period indicates the potential of collecting records, for an easily identified species, from wildlife enthusiasts who do not contribute records to county recorders or semi-structured citizen science schemes. This might be considered as a targeted add-on to future Atlas fieldwork.

Estimating the size of the wintering Blackcap population is highly problematic as there are limitations with all the datasets available, and it is clear that numbers in Wales vary considerably between years. We have extrapolated that, conservatively, a minimum of 700-1,000 are present every year, and that at least 2,000 individuals have occurred at least once in the last 10 years. However, these are strict minima. If the ratio of number of Blackcaps in Gardens (70.4%) to Non-gardens (29.6%) in BirdTrack was representative, those recorded by the RSPB Big Garden Birdwatch would only be a part of the picture, and the number across Wales would be almost 30% higher: 373-2,662 birds during January in the years 2004-21 (mean=1,288 individuals). Applying the reporting rate from the RSPB Big Garden Birdwatch to the total number of gardens in Wales, would have produced a far higher estimate. Using the Wales housing stock figures (Welsh Government 2020), and assuming that 88% of households have a garden (the UK average) and that 64% of households feed birds (a figure for England from Davies *et al*. 2012 as we have been unable to find data for Wales), produced a mean population estimate of 42,880 individuals during 2011-21 (15,760-88,855). This, however, does not account for the uneven distribution of Blackcaps across Wales, especially in relation to altitude and distance to coast.

Conclusion

The trend in Blackcap occurrence and abundance has been stable during the last 20 years, with similar reporting rates from BirdTrack, Bird Atlas 2007-11, BTO Garden BirdWatch and, at least until 2016/17, the RSPB Big Garden Birdwatch. The January 2021 Inquiry showed that Blackcap records were more widespread in North Wales than in winters 2007/08-2010/11, with twice as many as in the earlier period. There was variation in the numbers counted per record/garden, to a much greater

degree in the RSPB Big Garden Birdwatch, which showed a seven-fold difference between the highest and lowest counts, than in the BTO Garden Birdwatch, which showed a difference of only 2.25. We suggest that the population of wintering Blackcaps in Wales is a minimum of 2,000 birds, but may be considerably higher.

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Photo competition - highly commended
Waiting for lunch (Grey Heron): Tanya Liepins