

Chapter 11

Urban Ornithological Atlases in Europe: A Review

Maciej Luniak

Abstract For half a century regarded as the most appropriate methodological approach for censusing wild animals and plants, the atlases are also used for presenting the distribution of avifauna in European towns and cities. This chapter looks at ornithological atlases concerning solely an urban area and not in a much more extensive region of which that area is just a small part. To date (2014) at least 77 avifauna atlases have been published for 66 towns and cities in Europe. In Italy (44 atlases), Poland (12) and Germany (8), this is currently the usual way of describing the distribution of bird species within an entire urban area. The cartographic basis for presenting the material is usually a grid of cells based on Universal Transverse Mercator (UTM) or some other system like the Gauss-Krüger. Less commonly, the grid is defined by geographic coordinates, and, exceptionally, a mosaic of irregularly shaped plots may be used, as in the Turin and Warsaw atlases. The majority of atlases relate exclusively to breeding birds, the maps showing the probability of breeding and/or the number of breeding in the grid cells. Only a few urban atlases supply cartographic information on wintering birds or their year-round status. Repeat editions of atlases include maps comparing present and past distributions. For most cases each atlas cell was surveyed ca four times per season. The fieldwork usually lasted 1–2 years in small towns but from 3 to 10 years in larger ones. The number of observers was often independent of the size of the area to be surveyed: in some cases up to a dozen or so experienced ornithologists were involved, but usually a large number (50–60 to over 100) volunteers took part. Compared with traditional verbal descriptions, an atlas mapping the distribution of birds in an urban area is of greater use as a scientific document, as a source of data for urban planning and for popularising wildlife among its inhabitants. It ensures better coverage of the area, comparability and transparency of the data and is more useful for municipal administration purposes.

Keywords Urban birds • Avifauna of European cities • Methods of bird inventory • Ornithological cartography

M. Luniak (✉)

Museum & Institute of Zoology, Polish Academy of Sciences, Warsaw, Poland

e-mail: mluniak@pro.onet.pl

11.1 Introduction

The atlas as a way of describing the distribution of species of flora or fauna in a given area based on a specific cartographic formula, came into general use since around middle of twentieth century. In this form data from censuses of plants and animals were found to be better applicable (especially with use of computer techniques) in urban planning and nature conservation; as a scientific record, it also satisfied the requirements of rigour and comparability.

This method of describing bird life came into use in 1970, when the first ornithological atlas in Europe was compiled for the West Midlands region of England (Lord and Munns 1970). A few years later, however, four national atlases were published: for France (Yeatman 1976), Britain and Ireland (Sharrock 1976), Denmark (Dybbro 1976) and then West Germany (Rheinwald 1977). They opened a new chapter in European avifaunistics; in the development of which a leading part came to be played by the European Bird Census Committee (EBCC). The Atlas of European Breeding Birds (Hagemeyer and Blair 1998) was published under the auspices of EBCC. A similar working group is active in North America (North American Ornithological Atlas Committee). At present many European countries have ornithological atlases covering the whole state, a region or a smaller local area. Two reviews of such atlases have been published recently: that by Gibbons et al. (2007) is based on more than 400 of these atlases published between 1976 and 2005 in nearly 50 countries, while the one by Dunn and Weston (2008) analyses the content and utilisation of 272 atlases that appeared in print or on the Internet in 50 countries up to 2007. The latter review ignores, with three exceptions, ornithological atlases of towns and cities as separate entities.

The first bird atlas of a city is generally regarded as the one for the London area (Montier 1977). However, as this atlas covers an area of 3424 km² and encroaches far into rural areas, one would be justified in treating it as a regional atlas—a detailed version of a section of the UK atlas (Sharrock 1976) that was being compiled at the same time. Instead, the bird atlas for the West Berlin (Witt 1984) is actually the first one of its type.

This chapter, an extended and updated version of an earlier paper (Luniak 2013), focuses on atlases for which the area surveyed is the city itself and not a much wider area within which the city occupies just a small part. This premise therefore excludes regional atlases, even if they include large cities like Basel (Blattner and Kestenholz 1999), Bonn (Reinwald et al. 1984), Essen (Przygodda 1988) or Hamburg (Holzapfel et al. 1984). The first edition of the Moscow atlas (Kalyakin and Volzit 2006), for example, related to a vast area of some 47,000 km², in which the city itself, even within its widest administrative boundaries, covered a mere 1000 km². In the case of the two editions of the London atlas (Montier 1977; Hewlett 2002), the disproportion between the city's area and that covered by the atlas is much smaller, and therefore it is generally cited as an "urban" one. In contrast, the Paris atlas (Malher et al. 2010) covers only the fairly small central part of this metropolis. In similar vein, the atlases for Voronezh (Numerov et al. 2013)

and Brussels (Rabosee et al. 1995) do not include the extensive suburbs of these cities. A monograph, in non-atlas form, of the avifauna of 16 European cities was published by Kelcey and Rheinwald (2005).

11.2 The Spread of Urban Ornithological Atlases

At least 77 urban ornithological atlases have been published for 66 towns and cities in Europe since the appearance of the first ones for London (Montier 1977) and West Berlin (Witt 1984), and work is well advanced on a number of others. Atlases of this type appear to be specific to Europe; on other continents, e.g. North America, the preference is for regional or local atlases in which towns and cities make up just a fraction of a larger area surveyed. In Africa just one urban ornithological atlas has been produced—for Bloemfontein in the Republic of South Africa (Kopij 2001).

Italy is the absolute leader when it comes to urban bird atlases. By 2014 there were 44 such atlases for 38 Italian towns and cities (Fig. 11.1) and work is under



Fig. 11.1 Towns and cities in Italy for which ornithological atlases have been published. Off the map are two other cities with atlases—Caltanissetta in Sicily and Cagliari in Sardinia. *Underlined*—the cities for which there are repeat atlases

way on a number of others (M. Dinetti in litt. 2014). Urban atlases constitute the majority of all (70 or so) bird atlases which have appeared in Italy (Gibbons et al. 2007). This has been achieved by the Italian national working group which since 1980 has been inspiring and coordinating this kind of work (Fraissinet and Dinetti 2007). So great is the interest in Italy in urban bird surveys that a handbook on “urban ornithology” was published (Dinetti and Fraissinet 2001), probably the first such work in the world literature. Florence is the only city in the world that can boast three editions of bird atlases (Dinetti and Ascani 1990; Dinetti and Romano 2002; Dinetti 2009), compiled in consecutive decades. Five other Italian cities—Naples (Fraissinet 1995, 2006), Livorno (Leghorn) (Dinetti 1994; Dinetti et al. 2013), Milan, Cremona and Grosseto—have two editions of atlases (Dinetti 2009), and the repeat atlas for Rome (Cignini and Zapparoli 1996) is in preparation (M. Dinetti in litt. 2014). Most of the atlases for Italian cities are discussed in the reviews by Fraissinet and Dinetti (2007) and Dinetti (2009).

Poland is the country with the second largest number of urban ornithological atlases. To date (2014), 12 have been published for 11 towns and cities (Fig. 11.2), and further two are in preparation. They are for towns with less than 100 thousand inhabitants (Świebodzin, Sulechów, Gorzów, Leszno, Przemyśl, Jasło) and the two largest Polish cities—Warsaw (Luniak et al. 2001; Nowicki 2001) and Łódź (Janiszewski et al. 2009). Two atlases have been compiled for Warsaw, one covering the entire municipal area (494 km², Luniak et al. 2001) and the other giving the results of a more detailed survey of just the city centre (52 km², Nowicki 2001). The urban bird atlases for Poland are listed by Luniak (2013). Since 1990 only three non-atlas monographs on urban avifauna have appeared in Poland; the results of urban bird censuses in this country are thus published mainly in atlas form.

For **Germany** there are 8 bird atlases for 7 towns and cities (Fig. 11.3) This is not a lot considering the advanced state of avian faunistics in this country, where some 50 regional and local atlases have been compiled (Gibbons et al. 2007). A pivotal role was played by the West Berlin atlas (Witt 1984), which became a point of reference and inspiration for other works of this type in Europe. This particular atlas was a reflection of the political situation of the time: it could embrace only the western part of the city. On the other side of the Berlin Wall, another bird atlas was compiled for that part of the city lying within the borders of the German Democratic Republic (Degen and Otto 1988). Happily, history brought this artificial division to an end, and a bird distribution atlas for the whole of Berlin (Otto and Witt 2002) was compiled by two of the authors formerly separated by the Wall. Another German atlas worthy of note is the one for Hamburg (Mitschke and Baumung 2001). The remaining German atlases (Fig. 11.3) are for smaller towns and cities—Bielefeld (Laske et al. 1991), Halberstadt (Nicolai and Wadewitz 2003), Chemnitz (Flöter et al. 2006), Emden (Retting 2007) and Regensburg (Schlemmer et al. 2013).

Elsewhere in Europe urban ornithological atlases are rare (Fig. 11.3), even though the atlas, as a way of depicting bird distributions, is common. Among over 50 regional and local bird atlases for the **United Kingdom** mentioned by Gibbons et al. (2007), only two are for cities—London (Montier 1977; Hewlett



Fig. 11.2 Towns and cities in Poland for which ornithological atlases have been published. The *small dots*—towns with populations below 100,000

2002) and Leeds (Fuller et al. 1994). In **France** only two of the 21 bird atlases (Gibbons et al. 2007) are strictly urban atlases: one is of the central districts of Paris (Malher et al. 2010) and the other is of the small town of Douai (Boutroille 2005). Work is in hand on atlases of “Grand Paris” (762 km², F. Malher in litt. 2014) and Marseille (240 km², E. Barthelemy in litt. 2014). In **Spain** there are 25 bird atlases (Gibbons et al. 2007) but none as yet for urban areas was published. The first one, which included information about breeding and wintering bird fauna was carried out in Valencia, is awaiting publication (E. Murgui in litt. 2014); Breeding Bird Atlas of Barcelona (2012–2014) is in the process of publication (see Herrando et al. 2016). For other countries in Western Europe, there are two editions of the Brussels atlas (Rabosee et al. 1995; Weiserbs and Jacob 2007) and the Amsterdam atlas (Malchers and Daalder 1996). In central and southern Europe (apart from Poland and Italy), there are two atlases from the Czech Republic—for Prague (Fuchs et al. 2002) and Pardubice (Vranova et al. 2007)—and one from Bulgaria—for Sofia (Yankov 1992). In Russia and the countries of the former Soviet Union, there is the atlas for St. Petersburg (Khrabryi 1991) and the more

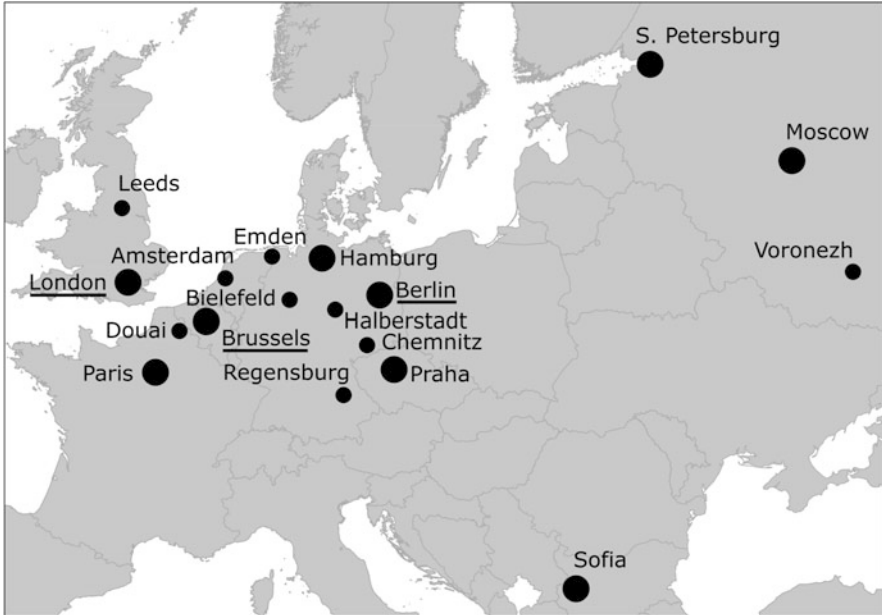


Fig. 11.3 Towns and cities in Europe (excluding Italy and Poland) for which ornithological atlases have been published. The *large dots*—cities with populations of more than one million. *Underlined*—the cities for which there are repeat atlases

recent ones for Moscow (Kalyakin et al. 2014) and Voronezh (Numerov et al. 2013). The atlases for Lviv in Ukraine (A. Bokotey in litt. 2014) and Kaliningrad (E. L. Lykov in litt. 2014) are awaiting publication.

Of the at least 66 European towns and cities for which bird distribution atlases have been published, repeat editions reflecting newer records (3 for Florence!) have been published for 9 of them. This makes up 14 % of all urban atlases, a proportion similar to that given for ornithological atlases of all kinds worldwide—12 % (Gibbons et al. 2007, $N = 411$) and 13 % (Dunn and Weston 2008, $N = 272$).

11.3 Cartography

In urban ornithological atlases, as in other faunistic or floristic atlases, various systems are used to map the records.

UTM Grid (Universal Transverse Mercator). This is based on a “flat” projection of a geographical area with divisions into squares, as well as wedges that compensate for the convexity of the earth’s surface. It is used mainly in Italy, except in the earlier atlases for Florence and Turin. Elsewhere, this system has been used for the atlases for Sofia, Pardubice, Voronezh and Moscow, but not in the atlases for towns

and cities in Poland and Germany. In Italy, the UTM grid was based on 0.25 km^2 squares in the atlases of the smaller towns and on $1 \times 1 \text{ km}$ (1 km^2) squares in those of the larger cities. In contrast, $2 \times 2 \text{ km}$ (4 km^2) tetrads were used for the Moscow atlas. Gibbons et al. (2007) estimate that some 75 % ($N = 252$) of ornithological atlases use the UTM grid or other grids based on a kilometre system (see below).

Other Types of Grid Using Rectangular Cells These were used in earlier atlases, e.g. those of St. Petersburg and some towns in Poland, and the system would often be the same as that used for national atlases, as in the London atlas. The largest such cells were applied in both London atlases ($2 \times 2 \text{ km}$) and the St. Petersburg atlas ($1.5 \times 1.5 \text{ km}$). In other atlases of large and medium-sized urban areas, as in the UTM system, the use of 1 km^2 squares was standard practice. In the atlases for small Polish towns, $200 \times 200 \text{ m}$ (0.04 km^2) and $500 \times 500 \text{ m}$ (0.25 km^2) squares were the norm. With the exception of the West Berlin atlas, all the atlases of German towns and cities use the national Gauss–Krüger grid (1 km^2).

Grids Based on Geographical Coordinates The West Berlin atlas (Witt 1984) was the first to use this approach and became a model for some later atlases. There,

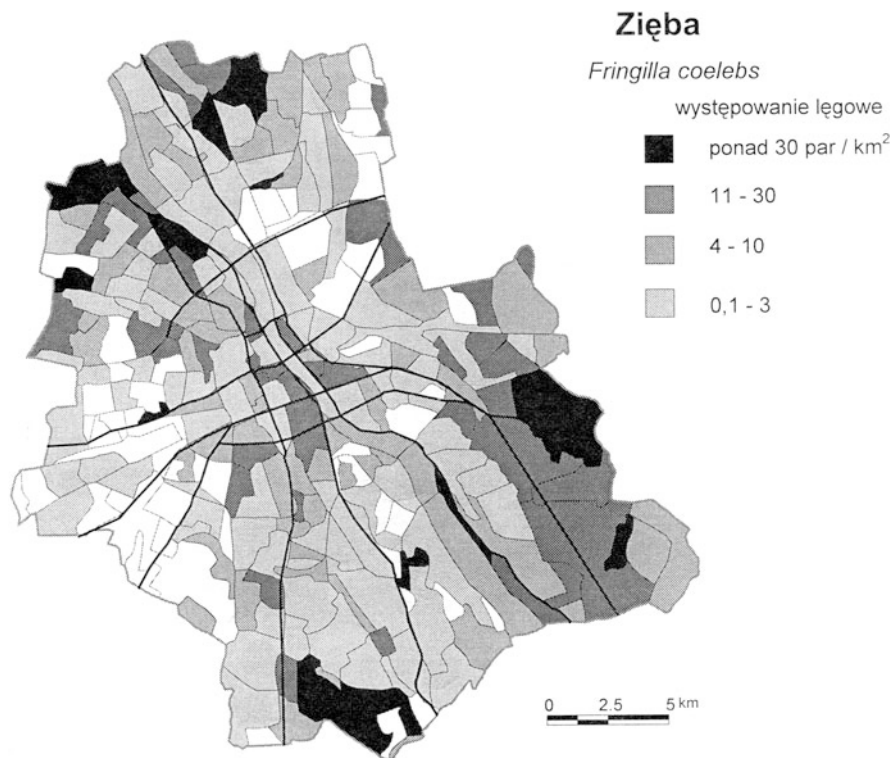


Fig. 11.4 An example of a species distribution map with irregularly shaped plots—the Warsaw atlas (Luniak et al. 2001)

the grid cells were delineated by 0.5 min of latitude and 1 min of longitude, i.e. 922×1132 m (1.04 km^2). This system was also used (exceptionally for Italy) in the first two editions of the Florence atlas (1990 and 2002), and more recently for the Polish city of Łódź (Janiszewski et al. 2009). According to reviews of ornithological atlases worldwide, this system is used in 20 % (Gibbons et al. 2007) and 32 % (Dunn and Weston 2008) of such works.

Division into Irregular Units This is based on the topography of environments and urban structure, e.g. streets, administrative divisions, etc. (Fig. 11.4). This system has been used in just two atlases, the ones for Turin (Maffei et al. 2001) and Warsaw (Luniak et al. 2001; Nowicki 2001). Drawbacks of this method include the difficulties in establishing criteria for dividing the area into atlas cells and in the workup and comparability of data relating to bird numbers in different cells. On the other hand, it is coherent with city maps, so it is better applicable in an administrative context. In the case of Turin, the atlas units were from 1.2 to 3.7 km^2 in area, whereas in Warsaw, their size ranged widely, from 0.26 km^2 (a small city centre park) to 9.62 km^2 (a suburban forest park).

11.4 Information on the Maps

The way in which information is displayed on the species distribution maps is specific to ornithological atlases, although obviously, the maps are accompanied by longer or shorter textual descriptions characterising the presence of particular species in an area and by chapters of a more general nature. The atlases under discussion here present the following parameters of a species' occurrence in the grid cells in a standard cartographic form, sometimes on several maps for that species.

Breeding Status and Season of Occurrence The great majority of atlases relate only to breeding birds. Breeding status on species distribution maps is often represented by three categories of probability, i.e. confirmed, probable or possible (Fig. 11.5), in accordance with the criteria applied in the European atlas (Hagemeijer and Blair 1998). The Moscow atlas (2014) uses a fourth category: "species observed during the breeding season but no evidence of breeding". The map legend usually summarises the number of squares with a given category of breeding probability. Only a few atlases provide maps of the occurrence of species outside the breeding season. The presence of a species in winter is given on separate maps only in the atlases for Moscow, Warsaw, Jasło (Stój and Dyczkowski 2002) and a few Italian cities, e.g. Naples, Venice and Bergamo. Data relating to the whole of the year outside the breeding season are given only in the atlases for Genoa, Milan and Turin (Dinetti 2009) and Moscow (2014). According to Dunn and Weston (2008), 81 % of ornithological atlases worldwide relate solely to breeding birds. Similarly, Gibbons et al. (2007) state that 12 % of such atlases

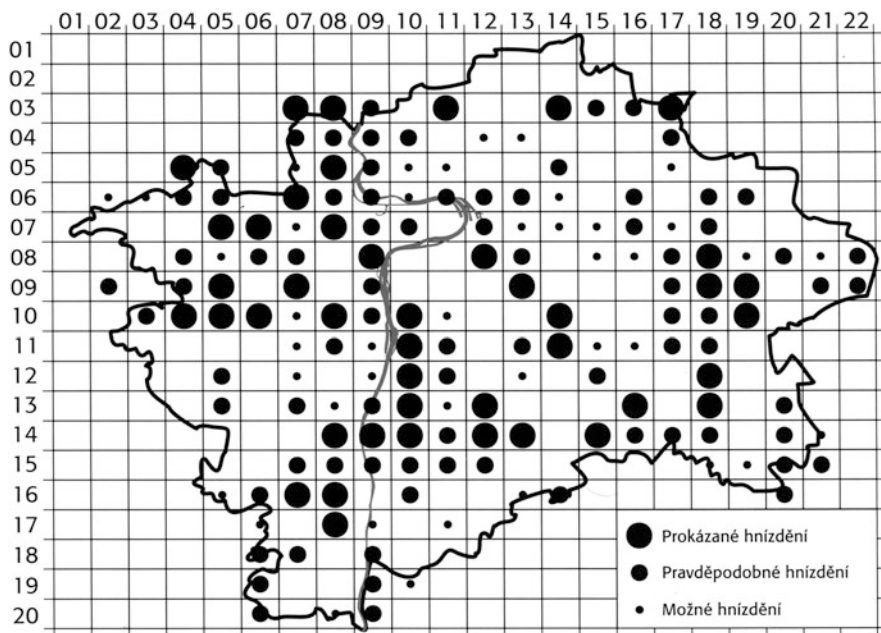


Fig. 11.5 A map showing the three categories of breeding probability—the Prague atlas (by courtesy of the authors—Fuchs et al. 2002)

contain data on overwintering and 7.5 % contain year-round data. The proportions in urban bird atlases are similar.

Bird numbers are taken into account in most of the recent urban bird atlases, although the two reviews of these atlases state that only 30 % (Gibbons et al. 2007) and 46 % (Dunn and Weston 2008) provide such information (for a review of census methods in urban areas, see van Heezik and Seddon 2016). Showing numbers of birds on the maps usually means forgoing the differentiation of breeding probabilities, e.g. in the atlases of Hamburg, Warsaw and Florence. In line with tradition, however, a few of the recent atlases—London (2002), Naples (2006), central Paris (2010) and Częstochowa (Czyż 2008)—show only the probability of breeding. The very recent atlases for Livorno (2013) and Moscow (2014) show both parameters—the degree of breeding probability and numbers of birds—on the same map; only the Prague atlas provides two separate maps with these data. Other recently published atlases, e.g. Voronezh (2013), Łódź (2009) and Regensburg (2013), give only numbers on the maps, usually on a logarithmic scale. The Regensburg atlas does not illustrate graphically the number intervals: the maps give absolute figures pertaining to pairs in different localities. The different cell sizes in the Warsaw atlas required (for common species only) relative numbers to be given as territory density per 10 ha. Italian atlases, e.g. Naples and Turin, show the numbers of birds outside the breeding season, the quantitative parameter being

the sighting frequency of a species. In contrast, the Moscow atlas (2014) states the maximum number of birds recorded outside the breeding season, and the atlases for Jasło (Poland) and Warsaw give the average number of birds per 10 ha per survey visit.

Distribution in Habitats Recent advances in colour printing have made it possible to map the distribution of bird species against the background of the main habitats in the city. The most advanced atlas in this respect is the one of Hamburg: instead of using a uniform environmental background for all the maps, just the habitats essential to a particular species have been selected. This approach shows more clearly how its distribution in an urban setting is determined by particular habitat.

Changes in Occurrence Atlas surveys of birds have been repeated in eight European towns and cities (13 %, $N=63$), and in Florence such surveys have taken place three times, at 10-year intervals (Figs. 11.1 and 11.3). This proportion is similar to the one given by Gibbons et al. (2007) for all bird distribution atlases worldwide (12 %, $N=411$). The repeat editions of the atlases supply additional maps of the past distribution of a species next to the main maps showing its present distribution. The second edition of the London atlas (2002) gives an additional map for each species showing the difference between the present distribution and that after the earlier census. The maps in the atlas for Olsztyn, Poland (Nowakowski et al. 2006) address the historical aspect by showing earlier (up to the year 2000) localities of a species, abandoned before the atlas census took place.

The context of a species' occurrence in a particular country in map form is shown only in the recent atlas for Pardubice (Vranova et al. 2007), which contains species distribution maps taken from the national atlas of the Czech Republic.

11.5 Fieldwork

No standardised census methodology is used in urban bird atlases. Only in Italy is all such fieldwork carried out in accordance using a national standard (Fraissinet and Dinetti 2007). In general, however, atlases follow the recommendations set out in the EBCC atlas (Hagemeijer and Blair 1998), particularly as concerns the categories of probability of breeding of a species. In the great majority of cases, each grid cell was surveyed 4 (rarely 3–5) times during a single year. The recommendation for the London atlas (2002) was that the fieldwork in each tetrad (2×2 km square) should last for a total of 12 h during the 4-month-long breeding season. For the Moscow atlas (2014), observers were required to monitor each tetrad for a total of 6 h in each month of the breeding season, and at the observer's discretion, at other times of the year. A more or less simplified version of the cartographic method was used for counts of particular species in the grid cells, especially species occurring in large numbers. Such counts are often done in only selected parts of grid cells, but they are then more intensive. In some atlases,

e.g. St. Petersburg and Voronezh, transect and point counts were done. For the Hamburg atlas, it was recommended that intensive counts should be done in one-third of a grid cell.

The **duration (years) of fieldwork** in atlas projects varied a great deal and was not always proportional to the size of the area to be studied. The shortest—1–2 years (seasons)—was usual in the smallest towns, such as Livorno, Parma and Gorzów Wielkopolski (Poland), but also in some larger ones, covering an area of 50–100 km², such as Regensburg, Florence and even Milan. Projects lasting 3–4 years were carried out in both smaller towns, e.g. Chemnitz, Pardubice (Czech Republic) and Jasło (Poland), and some of the largest cities like Rome or Hamburg. Quite frequently the atlas projects lasted for 5–10 years not only in large cities (Berlin (2002), Moscow (2014), St. Petersburg, Prague, Warsaw) but also in much smaller ones (Częstochowa, Padua, Voronezh). Examples of even longer studies are rare: the projects in Amsterdam and Turin lasted for 12 years. Sometimes, the atlas was published long (more than 10 years) after the fieldwork had been carried out, e.g. Warsaw, Prague, Olsztyn.

11.6 Project Participants

The atlas form of carrying out bird censuses is more labour-intensive than the traditional descriptive form as it requires complete coverage of the area to be surveyed. Hence a large number of field workers are needed for gathering basic data. But the advantage is that this collective work could be done according to a standardised methodology passed on to participants in fairly simple instructions.

The **features specific to urban atlases** mean that such projects are admirably suited to the involvement of volunteer observers:

- In most towns and cities, there are usually groups of birdwatchers who are familiar with the area and the local bird life. This makes it easy to recruit volunteers for the project, for whom such participation brings satisfaction and the opportunity to widen their ornithological experience.
- The impoverished avifauna in the urban landscape also makes it easier to carry out such a project. Likewise, since the study area is “close to home” and is usually smaller than one that has to be covered for a regional atlas, the fieldwork can be more intensive but less costly.
- In urban areas people and the media usually show a greater interest in their local bird life. This factor stimulates such projects and improves the chances of obtaining funding for them. It also contributes to the popularisation of ornithology and raises the awareness of nature among the local community.

The **number of participants** in bird atlas projects was not always proportional to the area to be covered. For example, only 40 recorders did the fieldwork for the extensive area of Berlin—892 km² (Otto and Witt 2002), while 130 worked in the much smaller area covered for the Brussels atlas—162 km² (Rabosee et al. 1995).

Large numbers of observers also took part in the fieldwork for the atlases of Prague (532 km²)—154 participants, Venice (414 km²)—155 (M. Dinetti in litt. 2014), Amsterdam (432 km²)—103 and Hamburg (747 km²)—89. The number of observers was the largest in the case of the Moscow (972 km²) atlas (2014): here, 313 people supplied data, 112 of whom carried out standardised field censuses in the grid cells. Only in a few cases was the fieldwork done by one or a few authors of the atlas, usually professional ornithologists, as in Sofia, Olsztyn and Przemyśl. The largest area of such “elite” fieldwork was St. Petersburg (ca 500 km²), where the records were gathered by a dozen or so fieldworkers. For the Voronezh atlas (189 km²), the basic fieldwork was done by just 11 observers, but records were accepted from some 400 people.

11.7 The Use of Urban Ornithological Atlases

In Italy, Poland and Germany, the atlas form is currently the most common means of describing of avifauna of cities. In a review of 270 such atlases from the worldwide ornithological literature, Dunn and Weston (2008) mention as many as 15 ways of applying the information they contain. Authors above in their assessment of 97 publications generated from atlases in Britain and Ireland, Southern Africa and Australia indicated that majority of considered papers concerned distribution of birds (27%), planning and land management (27%) and ecology (21%). In Europe examples of use of atlases as a source of data for faunistic and ecological analyses of an urban avifauna are works of Ferenc et al. (2014), Herrando et al. (2012, 2016), Murgui (2009) or Witt et al. (2005), and in the global scale—the work of Aronson et al. (2014). In spite of those examples, Dunn and Weston (2008) conclude that “. . . atlas data seem underutilised”. Similarly, Murgui (2009) claimed that “. . . the potential of studies mapping the distribution of birds in cities probably has not fully developed”.

The **significance and applications** of urban bird atlases, especially in comparison with the traditional descriptive approach, are mainly justified by the following arguments:

- Such atlases are scientific documents of the bird life of a town/city; they ensure complete coverage of the area to be surveyed and better comparability of data over time (in monitoring programmes) and in relation to different areas.
- Compared to the descriptive approach, atlases present the relevant information in a more transparent, concise form, which is readily comprehensible to a reader unfamiliar with the language they are written in.
- They are a source of data for knowledge of specific ecological and behavioural relationships of birds in an urban setting, e.g. the synurbisation (Luniak 2009) of urban populations, and the changes they are subject to. Such information is more difficult if not impossible to obtain from regional atlases, in which the town/city makes up just a small part of the area explored.

- They provide information for urban planning and other applications in an administratively friendly form.
- They activate and integrate the local birdwatching community and enhance the ornithological expertise of its members.
- They contribute to nature education and increase the awareness of birds among the inhabitants of an urban area, its administrators and the media. In cities there is a special need for data on its birdlife in a form friendly to town planning and the popularisation of ornithology.

It is why an atlas form should be recommended for works describing composition and distribution of the avifauna of urban areas.

The **drawbacks of the atlas form**, compared to the traditional descriptive approach, are that it requires a greater intensity of fieldwork in order to achieve complete coverage of the study area, specialist data processing and a greater financial outlay for printing the maps. In the case of an urban atlas, however, these difficulties should be easier to surmount, since local sponsors are more likely to support a local undertaking; the costs of the fieldwork will be lower, too.

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