

## European Breeding Bird Atlas 2 nearly finished

*The second European Breeding Bird Atlas (EBBA2) is planned to be published as a book in December 2020. Later, the outputs will also be made available online. With the help of around 120 000 fieldworkers, this is probably the largest citizen-science project in Europe, covering 96% of the whole territory. It provides up-to-date information on breeding distribution and abundance of all 596 native and non-native bird species in Europe. Comparison with the data from the 1980s collected for the first atlas shows marked changes in breeding bird distribution in Europe. The EBBA2 data and outputs will be the basis for further research to understand the drivers of change and inform nature conservation and policy.*

### **Ten years ago the EBCC decided to organise a new breeding bird atlas.**

The first European Breeding Bird Atlas (EBBA1) was the first collective work of ornithologists in Europe and widely used in research and nature conservation (*Herrando et al. Bird Study 66 (2019): 149-158*, <https://www.tandfonline.com/doi/full/10.1080/00063657.2019.1618242>). Since its publication in 1997, however, European landscapes and climate have changed and affected bird distribution and abundance. This was, among other reasons, behind a decision of the European Bird Census Council (EBCC [www.ebcc.info](http://www.ebcc.info)) made at its conference in Caceres (Spain) in 2010 to organise the second European Breeding Bird Atlas (EBBA2). The EBCC immediately started to plan and mobilise its network for what should probably be considered in many aspects as the biggest citizen science project ever made at a continental scale. The EBCC board assigned the coordination role to the new Atlas Steering Committee and day-to-day work was delegated to the coordination team comprising experts from the Swiss Ornithological Institute (SOI [www.vogelwarte.ch](http://www.vogelwarte.ch)), the Catalan Ornithological Institute (ICO [www.ornitologia.org](http://www.ornitologia.org)) and the Czech Society for Ornithology (CSO [www.birdlife.cz](http://www.birdlife.cz)). Many other organisations and individuals contributed to the project, too ([www.ebba2.info](http://www.ebba2.info)).

### **Thousands of fieldworkers collected data across Europe between 2013 and 2017**

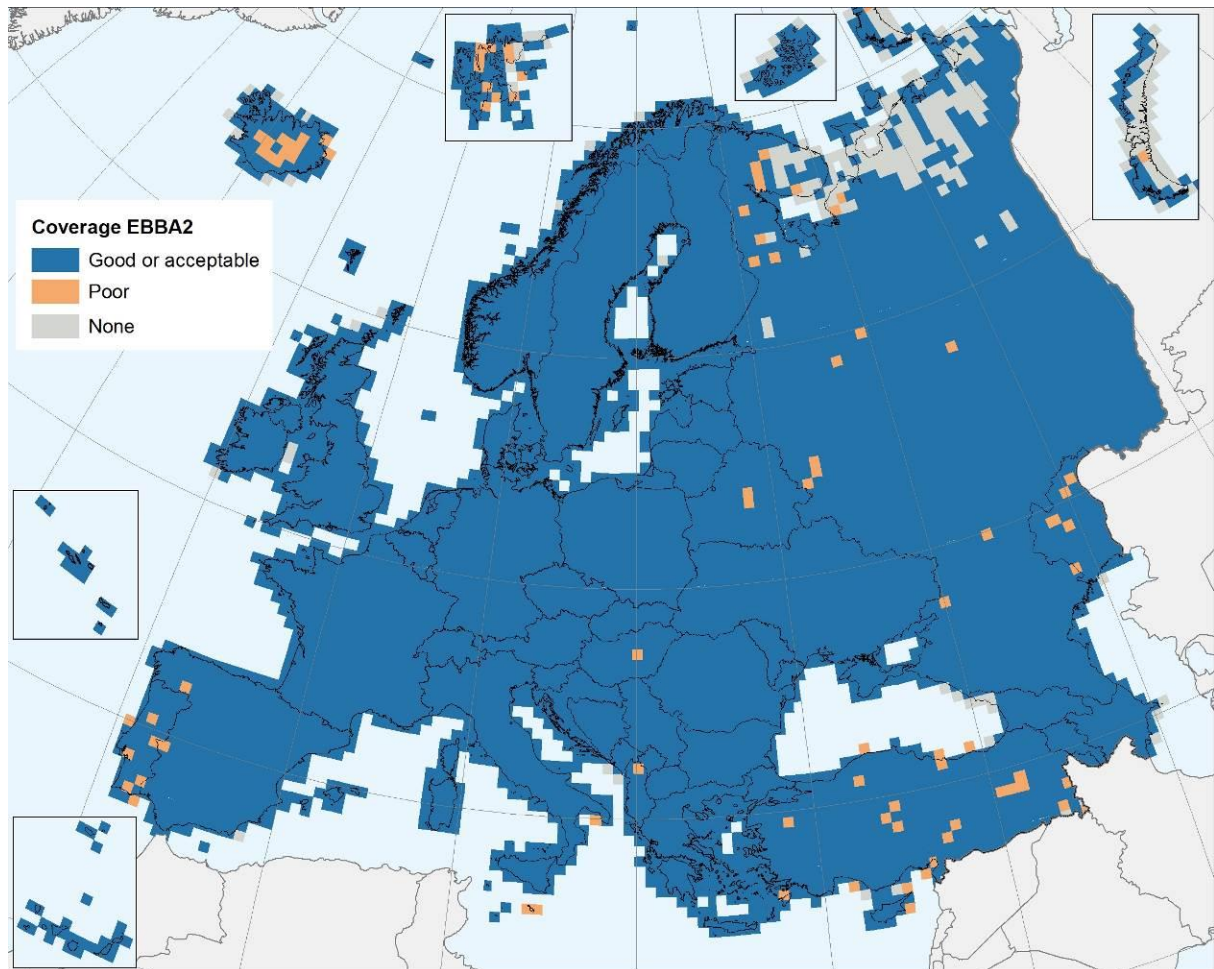
The project was challenging due to its large spatial scale and diversity in countries' approaches. EBBA2 covers the whole of Europe including the European parts of Russia and Kazakhstan, the whole of Turkey, Cyprus and the archipelagos in the Atlantic and Arctic Oceans and in the Mediterranean Sea. In consultation with the network of national coordinators, a standard though simple methodology was developed (*Herrando et al, Bird Census News 2013, 26/1-2: 6-14*). Fieldworkers, under the guidance of national coordinators, have collected data on species occurrence and probability of breeding in a grid of 50x50 km. 5 110 50-km squares (96% of the total area) were surveyed. Every breeding bird observation done by skilled ornithologists and birdwatchers, including information on location, date and breeding status (atlas code), was useful and contributed to the results. Furthermore, the fieldworkers performed more systematic surveys with the aim to deliver complete lists of species observed during a given time slot. **Around 120 000 fieldworkers contributed their data on species occurrence and atlas codes while some 35 000 did the systematic timed species surveys.** The data collected via online portals (see [www.eurobirdportal.org](http://www.eurobirdportal.org)) were useful as well.



*In several countries (e.g. Serbia and Bosnia & Herzegovina among others) field training in methods was organised usually with an active participation of EBCC experts. Photo by P. Voříšek and V. Keller.*

**Online tools helped to collect and check the national data sets**

Collecting 48 national datasets poses a challenge not only due to the large number of records (e.g. more than 500 000 records from 5 110 squares in more than 600 species in the final database of the 50x50 km data). For instance, information from squares along the border of two or more countries, needed adjustments of final abundance values. Also, checking the data quality in general or standardising species lists were complicated. This tough job was easier thanks to online tools developed at ICO, which allowed the coordination team to share the data with the national coordinators and species experts, who could then suggest changes online as well.



*EBBA2 coverage: the great majority of the EBBA2 area was covered by fieldwork. The 50-km squares which were not covered or were covered poorly are usually those in remote areas or in areas where access was difficult for other reasons.*

***We kept the contact via emails, website, social media, meetings and workshops***

Keeping in touch in such a complex project is a key for its success. From the very beginning, the EBBA2 coordination team did its best to keep the national coordinators informed via emails. In 2014, a dedicated website [www.ebba2.info](http://www.ebba2.info) was established. At the same time we started to inform the wider public also via Facebook and Twitter. Numerous bilateral contacts between the national coordinators and the coordination team helped to solve problems with methods, data collection and delivery. However useful online communication is, face to face contacts were also necessary.



*Workshops and meetings were organised not only at the EBCC conferences, but also as dedicated meetings where we worked together on the real data: here, the final workshop project supported by the MAVA Foundation organised in December 2019 in Croatia. Photo by P. Voříšek.*

***Fieldwork was a challenge in some areas, but coverage in EBBA2 exceeded the initial expectations***

There are areas in Europe where infrastructure (e.g. roads) is less developed and access is difficult. Land mines or ongoing conflicts made other areas impossible to visit or at least made fieldwork more difficult than expected. Despite the many challenging circumstances and thanks to the enormous effort of the national coordinators and fieldworkers, there were only 4% of all 50x50 squares which were not visited at all. Obviously, gaps remained in some areas and lower intensity of coverage has to be taken into account when interpreting the results.



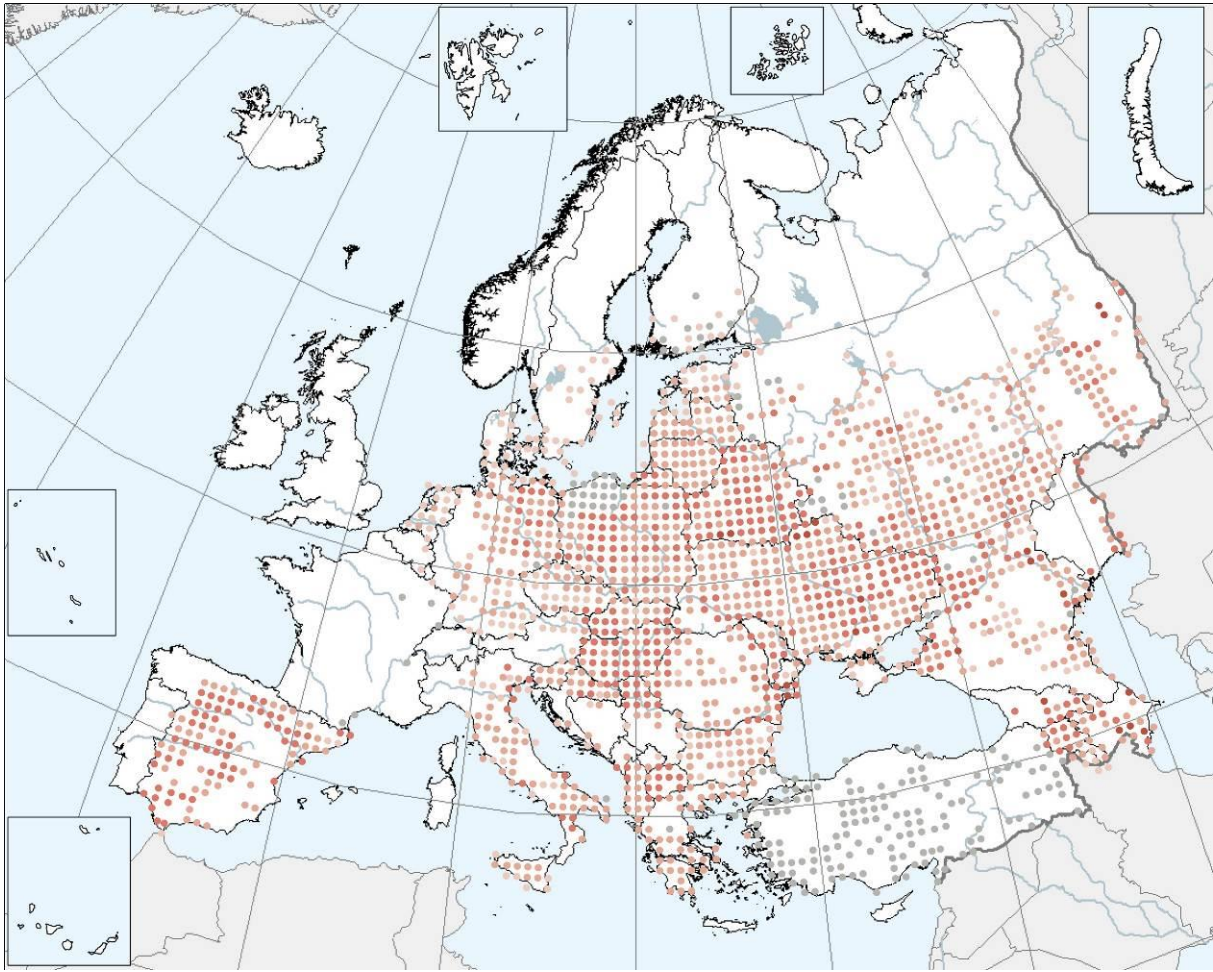
*Vast areas in Belarus are covered by wetlands which are difficult to access. Photo by P. Voříšek.*

***We wouldn't have made EBBA2 happen without external funding. Big donations and many small ones have helped to make the atlas happen***

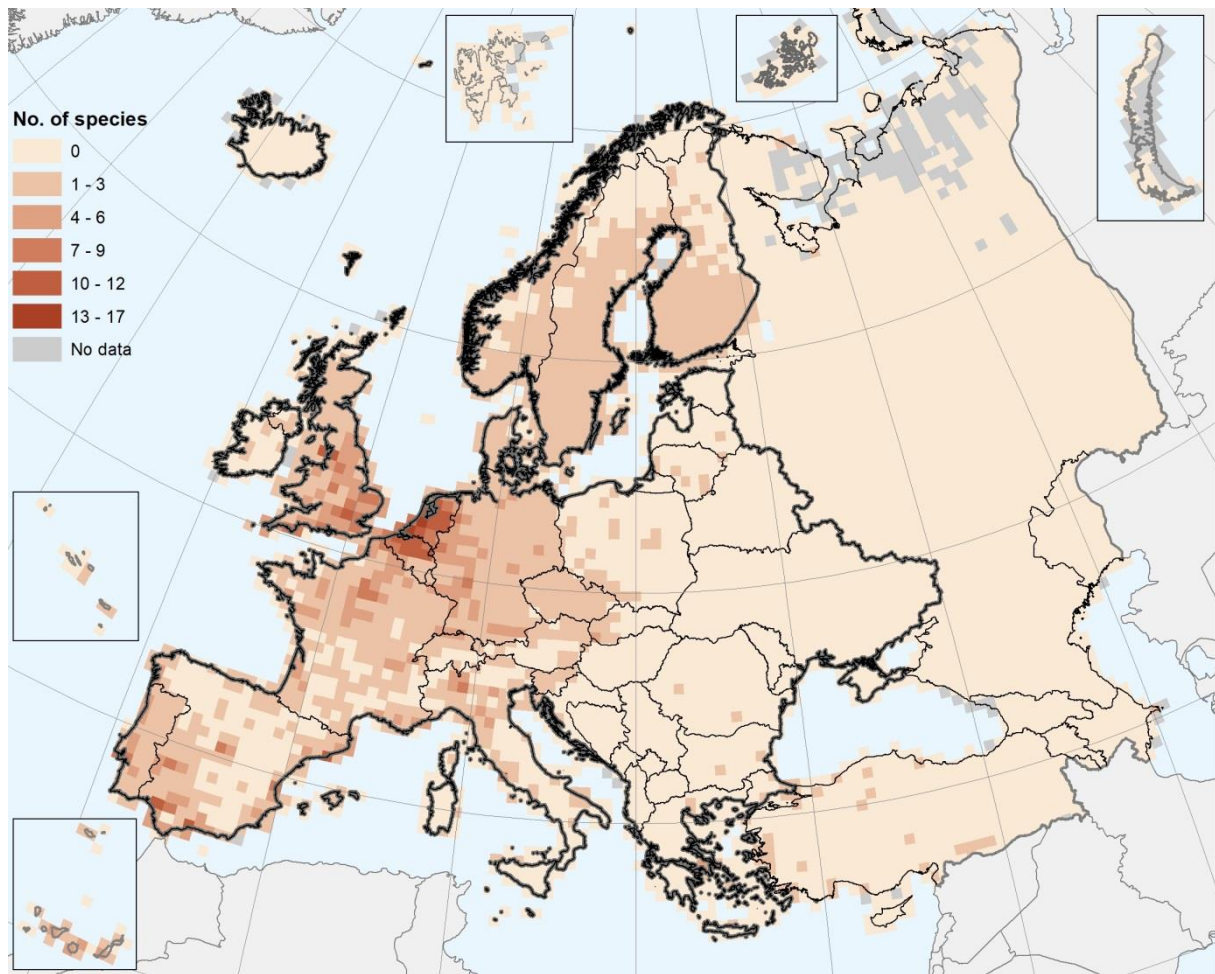
Despite the fact that fieldwork in bird atlases is usually based on the effort of volunteer birdwatchers, atlas work is not completely for free and needs funding. Many national atlases were able to raise funds and did not need any further assistance from the EBBA2 coordination team. In other countries, the funding sources were very limited or did not exist at all. Often, not much funding is needed to deliver a great piece of work in such countries. We were happy to receive support particularly from the MAVA Foundation, which helped substantially to make the EBBA2 happen in eastern and southern parts of Europe (<https://www.ebba2.info/2017/12/12/the-final-workshop-of-the-mava-project-in-croatia-preparing-for-the-real-data-submission/>). Other donors helped as well and will be fully acknowledged in the book and/or the EBBA2 website. Many donors have also contributed via the species sponsorship scheme (<https://www.ebba2.info/support-ebba2/ebba2-species-sponsorship/>). The scheme, which collected more than 100 000 Euro is still going on and everybody is encouraged to help. Further funds were obtained thanks to the artists who have shared their income from the sale of their paintings (<https://www.ebba2.info/support-ebba2-2/illustrations-for-ebba2/>). Fieldwork, data collection and writing of the texts are done, but funding will be needed to make the book accessible to as many readers as possible. Further capacity is also needed to make the results available online.

### ***596 species were found breeding in Europe***

The atlas revealed that 539 native bird species have bred in the EBBA2 area during 2013–2017. Some are widespread and were found in almost all 50x50 squares, other species occur in Europe only in restricted areas and were found in few squares. More than 50% of the species occurred in less than 10% of all surveyed squares. EBBA2 also documented breeding for 57 non-native species in Europe.



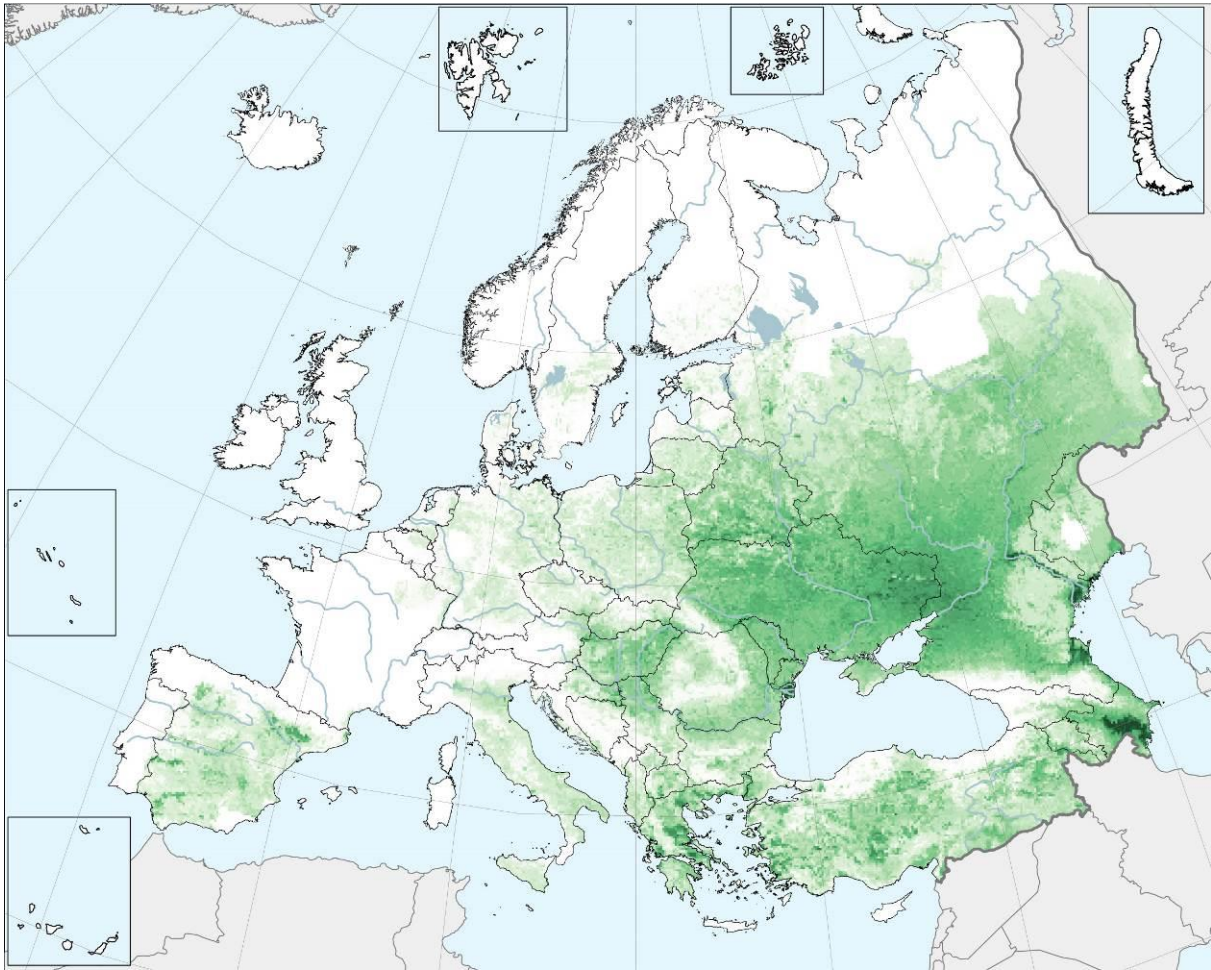
Abundance of the Eurasian Penduline-tit (*Remiz pendulinus*) in Europe, an example of a 50-km map.



*Number of non-native species found in 50-km squares across Europe.*

***For the first time, modelled maps show the probability of occurrence across the continent***

For the first time in Europe, EBBA2 produced modelled maps of the distribution of breeding birds at a scale of 10x10 km based on systematic timed surveys. The available data allowed producing reliable maps for 224 species. The modelled maps bring an added value particularly in case of common and widespread species as they show areas where the core populations occur.

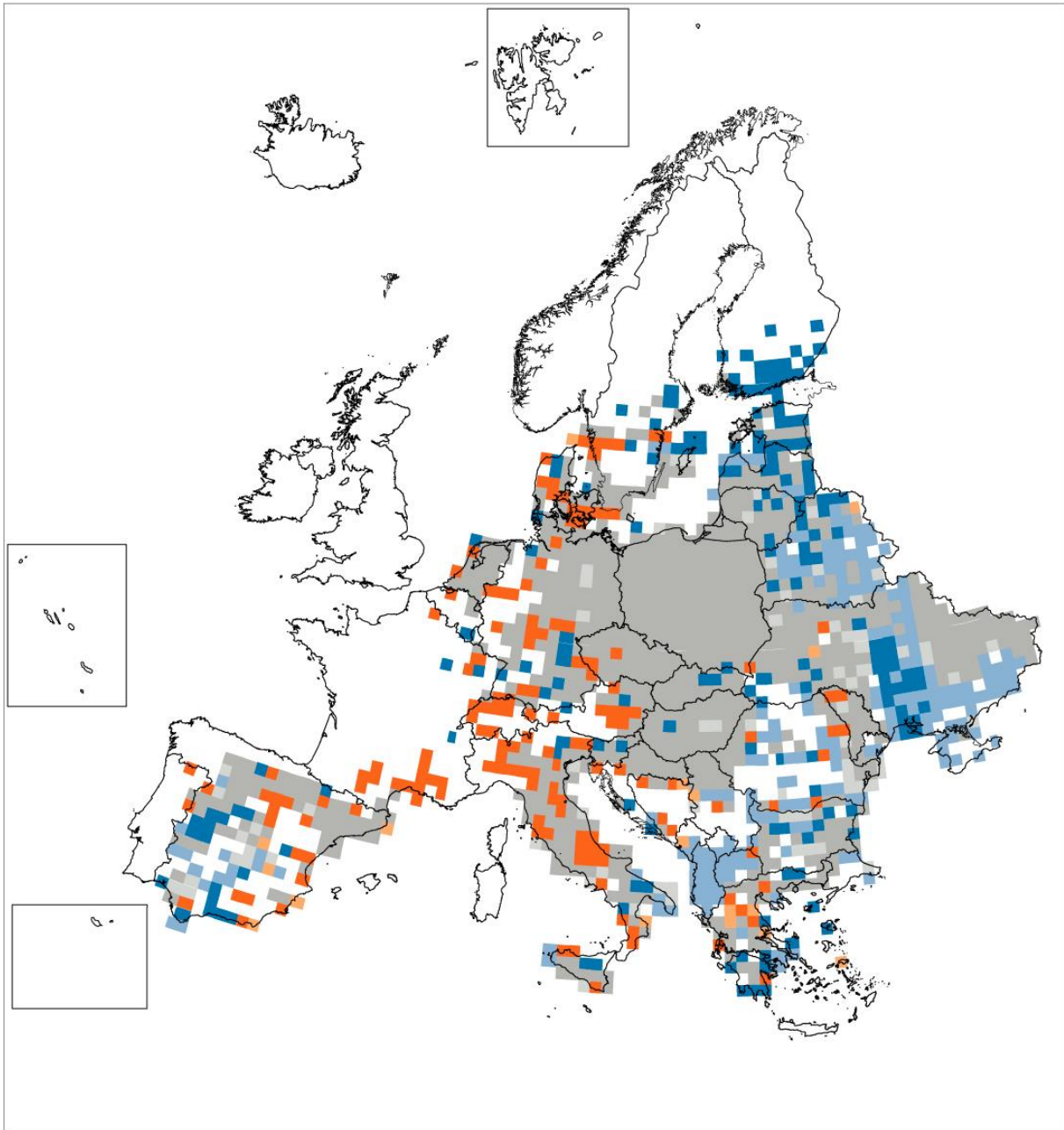


*Probability of occurrence of the Eurasian Penduline-tit (*Remiz pendulinus*) in 10-km squares. Example of a modelled map.*

***Comparison between EBBA2 and EBBA1 shows changes in breeding bird distribution in Europe***

Whenever it is possible, EBBA2 will also present maps of change. The maps show the change in species distribution between EBBA1 and EBBA2. Only the areas which were sufficiently covered in both atlases can be compared. Nevertheless, the maps provide an excellent insight into the changes in the European avifauna over the last 30 years. Although there are species shifting their distribution in various directions, it appears that a northward expansion is a trend often detected. The increase in the range of many non-native species in Europe was also detected in the EBBA2 outputs. The overall results of explorations into patterns and changes in distribution of species will be published in the book, a scientific paper is also planned to be published.



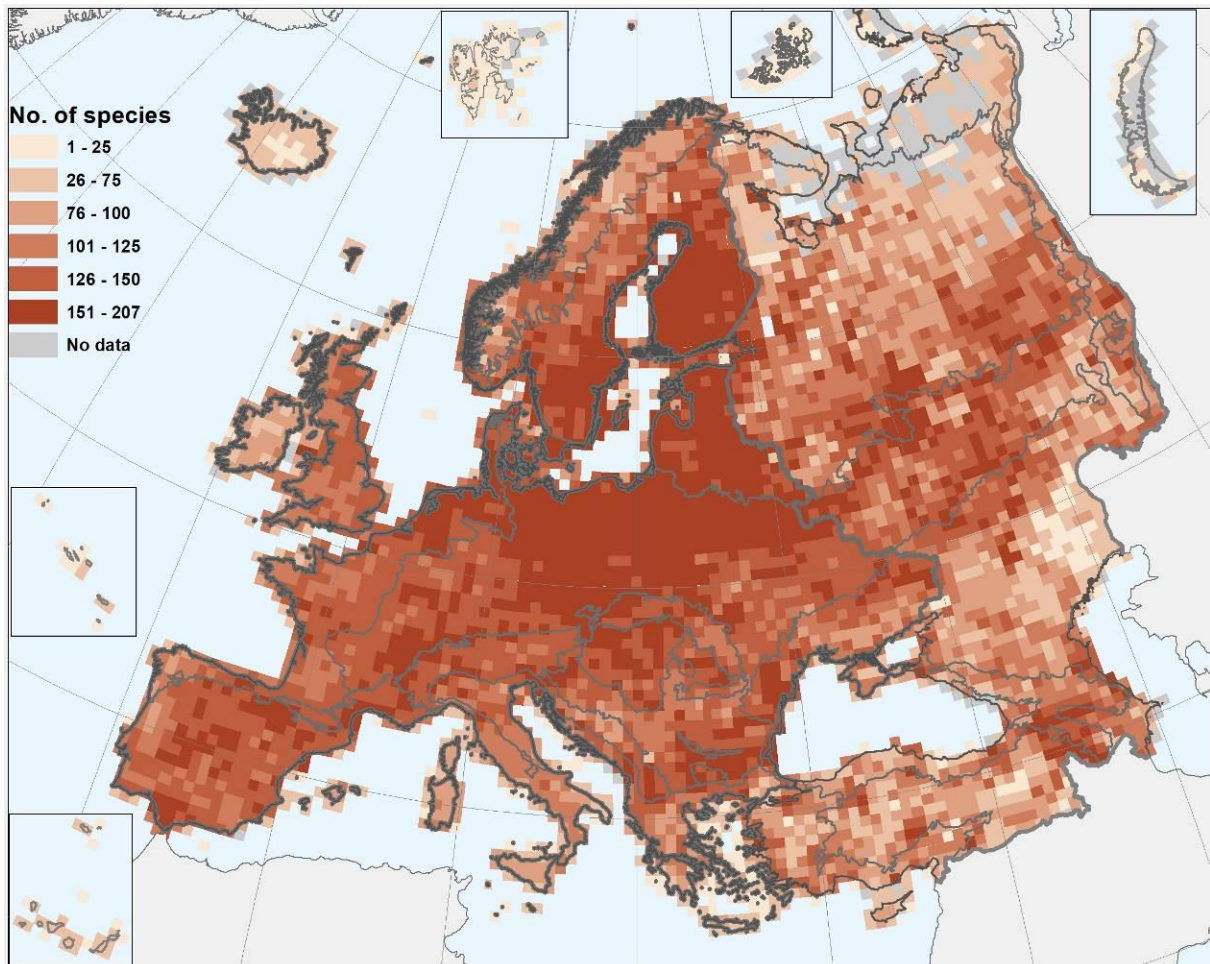


*Change in the distribution of the Eurasian Penduline-tit (*Remiz pendulinus*). Example of change map between EBBA1 and EBBA2. Orange squares – loss, blue squares – gain, grey squares – no change. The intensity of the colours indicates data quality, the darker the better.*

***The publication of the book is planned for December 2020, results will also be available online***

The book **European Breeding Bird Atlas 2: Distribution, Abundance and Change** will be published in cooperation with Lynx Edicions ([www.lynxeds.com](http://www.lynxeds.com)), a publisher well known to many ornithologists and birdwatchers. It is estimated that the book will have some 1000 pages. Species accounts will make up the bulk of the book. For each species the best available information will be shown, i.e. 50-km abundance maps, and, where appropriate, 10-km modelled maps and EBBA1 vs EBBA2 change maps. A short text will facilitate the interpretation of the maps for each species. 45 artists from

across Europe provided their paintings and thanks to them the species texts and maps will be accompanied by high quality illustrations of the species. The general chapters will provide a description of methods used, guidelines for reading and interpreting the maps and overall analyses of patterns in bird distribution. Later, the results of the project will also be available online including open access to some data (<https://www.ebba2.info/results/data-access-policy/>).



*Number of species observed per 50-km square. Note that information in eastern Europe should be interpreted with caution because of its uneven intensity of coverage.*

### ***National atlases and further bird monitoring initiatives are indirect consequences of EBBA2***

Using synergies with EBBA2, several countries have initiated and some have already published their own national atlases. These atlases usually provide outputs at more detailed spatial scale, often with national population estimates of species and other more detailed outputs. The EBBA2 coordination team tries to keep the information on national atlases up to date and to promote the national atlases once they are published (<https://www.ebba2.info/2018/12/18/swiss-breeding-bird-atlas-2013-2016/>, <https://www.ebba2.info/2018/12/18/bird-atlas-of-the-netherlands/>).

Participation in EBBA2 also increased interest in developing generic bird monitoring schemes, online portals and training volunteers in bird identification. These initiatives are appreciated as they can improve the coverage of Europe by high quality bird monitoring data.



*The Slovenian breeding bird atlas was published in March 2019.*

***EBBA2 is the result of a common passion and effort of many individuals and organisations and can serve as an example of large-scale citizen science projects***

Such a large project could not have achieved its goals without thousands of dedicated fieldworkers, national coordinators and data providers, without donors and organisations supporting the EBCC.



*Czech birdwatchers in Belarus. Photo by P. Voříšek.*

We specifically thank all the fieldworkers for their great efforts. They will be acknowledged via the websites or books of the national atlases and via a dedicated section of the EBBA2 website!

***The book is planned to be published in December 2020***

The European Bird Census Council and Lynx edicions are doing their best to keep the publication date despite the difficult situation across Europe. In parallel, the work on making the outputs available online continues. The EBCC aims to make the outputs available and used in science and nature conservation as much as possible.

Keep up with news from the final phases of the project via the web site as well as the social networks (Facebook and Twitter).

*Petr Voříšek, Verena Keller, Sergi Herrando*