EUROPEAN ATLAS NEWS

EBBA2: Latest pilot maps, modelling work and planning ahead
Promoted and organised by the European Bird Census Council

Sergi Herrando¹, Martí Franch¹, Petr Voříšek², Marina Kipson², Pietro Milanesi³ and Verena Keller³

² Czech Society for Ornithology. Na Belidle 34 CZ-150 00 Prague 5, Czech Republic.
³ Swiss Ornithological Institute. Seerose 1. CH-6204 Sempach, Switzerland.

e-mail addresses by order of signature: ornitologia@ornitologia.org, marti.franch@ornitologia.org, EuroMonitoring@birdlife.cz, kipson@birdlife.cz, pietro.milanesi@vogelwarte.ch, verena.keller@vogelwarte.ch

Abstract. The last fieldwork year of EBBA2 is ongoing in 2017. A third pilot data for the European Breeding Bird Atlas 2 (EBBA2) was requested in 2016. Preliminary 50x50 km data for 15 species from all European countries were provided in a new effort of international collaboration and pilot maps were made available to the whole European atlas community. In parallel, a great progress in 10x10 km modelled maps was made thanks to the timed surveys data provided in 2015. This article summarises this work and the planning ahead up to EBBA2 publication.

Introduction

Thirty years after the production of the first European Breeding Bird Atlas (Hagemeijer & Blair 1997), the European Bird Census Council (EBCC) is working on a new European bird atlas to update the information on the distribution of breeding birds and to determine the changes occurred since then (Keller 2013). The network of national coordinators has provided three different pilot datasets during the EBBA2 fieldwork period (2013–2017). These data exchanges between national and European coordinators represented a valuable work to establish the protocols needed to mobilise the appropriate datasets in a common framework. In addition, expertise coming from all EBCC partners allowed a feedback process to fine tune the protocols for the final provision. Finally, pilot data provisions were very useful to identify gaps in coverage and capacity, and to generate preliminary maps for the promotion of the project both at European and national scales.
A previous report of the project in this journal showed the encouraging results of the first pilot data request, when 50x50 km data for five species (Eurasian Oystercatcher Haematopus ostralegus, Common Black-headed Gull Larus ridibundus, Northern Harrier Circus cyaneus, European Bee-eater Merops apiaster and Northern Wheatear Oenanthe oenanthe) were gathered (Herrando et al. 2015). In late 2015 a second provision of pilot data was carried out. In that case, preliminary datasets of standardised surveys were gathered and a series of pilot models were developed. In 2016 a third and latest pilot provision of 50x50 km data for 15 species was made. This report briefly summarises the results of these two provisions of preliminary data and shows the strategy developed for the final data provision, planned to be implemented during the second half of 2017 and beginning of 2018.
The preliminary provision of timed visits and first pilot models

In 2015 national coordinators kindly provided to the EBBA2 coordination team a set of standardised data. These data were named “timed visits” because of the expected importance of the duration of the survey in terms of standardisation. In some countries, this dataset was later enriched with new timed visits data during the year 2016 and beginning of 2017. The set of standardised data includes more than 1.7 million observations in roughly 12,400 sites located in 44 countries (Figure 1). In total, records for more than 580 species were gathered. This is very probably the widest dataset of standard data ever collected in the whole of Europe and thus represents the fundamental pillar of the EBBA2 pilot modelling. In some countries, just a selection of data available was provided. In others, current fieldwork is constantly improving the coverage. This indicates that the final dataset for the real EBBA2 modelling will be even more impressive.

Currently, this dataset is being used to explore the best way of producing EBBA2 10×10 km maps by means of species distribution models (SDMs). SDMs allow inference of species occurrence in non-surveyed squares on the basis of knowledge of the patterns of species occurrence and environmental associations in a number of surveyed areas (Guisan & Zimmermann 2000). In order to achieve this goal we are evaluating 10 different algorithms to develop SDMs (Herrando et al. 2017), as well as their ensemble predictions, combining species occurrences (presences/absence data) with environmental predictors (Milanesi et al. 2017). As result, a series of preliminary maps are produced, such as a first pilot map for the Sardinian Warbler (Sylvia melanocephala) (Figure 2).
There is still room for improvement. Actually, not only precise locations of observations were reported in this preliminary data provision but also sampling method applied, time spent during each survey and date in which it was carried out. This information could be fundamental in order to overcome biased estimation of species occurrence due to the heterogeneity in data collection all around Europe. Therefore, we are currently exploring possible ways to integrate them in SDMs. Moreover, we are carrying out further tests to estimate species-specific detection probability (estimated through repeated visits) and how to include it in SDMs as well as integrate information of bird occurrence at 50×50 km squares to overcome issues related to spatial autocorrelation. We expect that these additional tests will potentially strengthen the decision regarding the final modelling strategy to apply on the final data provision in the context of EBBA2.

The third data provision (50×50 km data)

The third data provision was similar to the first data provision since it referred to the EBBA2 information on breeding birds at 50×50 km level. In this occasion, European coordinators requested data for the same five bird species included in the first data provision to evaluate project progress, particularly in the Eastern and Southeastern countries in which special efforts were implemented for EBBA2. In addition, a new set of 10 species was included with the intention to cover a diverse typology of species. Thus, this new set included species surveyed by means of very distinct fieldwork approaches or which have very different habitats, detectability, breeding status or recent taxonomic changes. So, the overall list of 15 species was the following: Great Cormorant (*Phalacrocorax carbo*), European Shag (*Phalacrocorax aristotelis*), Northern Harrier (*Circus cyaneus*), Baillon’s Crake (*Porzana pusilla*), Eurasian Oystercatcher (*Haematopus ostralegus*), Common Sandpiper (*Actitis hypoleucos*), Common Black-headed Gull (*Larus ridibundus*), Yellow-legged Gull (*Larus michahellis*), Rose-ringed Parakeet (*Psittacula krameri*), Eurasian Eagle-owl (*Bubo bubo*), European Bee-eater (*Merops apiaster*), Sardinian Warbler (*Sylvia melanocephala*), Wallcreeper (*Tichodroma muraria*), Eurasian Blackbird (*Turdus merula*) and Northern Wheatear (*Oenanthe oenanthe*).

A total of 20,649 records from a total of 3,952 50×50 km squares were gathered from all European countries, the great majority compiled and
sent by the national coordinators. The total coverage reached 75% of European 50×50 km squares and the great majority of the data was reported for the EBBA2 fieldwork period 2013–2016. After careful data management and search for potential mistakes, maps showing info at country level were circulated and discussed with national coordinators when necessary. Three types of pilot maps were developed and shared among the network of national coordinators: breeding occurrence (including data on first European atlas), breeding category and abundance. All the information for these 15 species is available in the EBBA2 Map Viewer (http://mapviewer.ebba2.info/).
As a first example of the great dataset compiled in the third data provision we wish to present here the pilot maps available for one of the species that have certainly increased considerably its distribution during the last 30 years: the Great Cormorant (Figure 3). In the first European atlas breeding evidence (confirmed, probable or possible) was reported for a total of 389 squares. In this pilot dataset 1,014 squares were reported (674 confirmed, 78 probable and 362 possible). Regarding population estimates, 1–9 pairs were reported in 105 squares, 10–99 pairs in 196 squares, 100–999 pairs in 199, 1000–9999 in 56 and 2 squares had, according to their national coordinators, from 10,000 to 99,999 pairs each. These latter two squares with the highest reported abundance for this species were located in the Volga delta (Russia) and in the Azov Sea (Ukraine). This is an interesting species which has attracted the attention of a specific working group. We aim to cooperate with it to improve the final dataset for the species.

In a second example we focus on the project progress by showing maps compiled for the Bee-eater in both the first pilot provision of 50×50 km data (2014) and the third one (2016) (Figure 4). The species was recorded in 973 squares in the first European atlas, when a considerable part of its breeding range in Eastern Europe was not covered. In the context of EBBA2, the Bee-eater has been reported in 1,197 and 1,693 squares in the first and third data provisions, respectively. The progress done during the last two years is greatly concentrated in Eastern Europe, but also in other parts of its range such as the Iberian Peninsula. The map also shows a good example of the efforts done to cover areas where fieldwork is extremely difficult under current political situation, such as the Southeast of Turkey. In that area, the data shown correspond to data compiled by a regional atlas project carried out some years ago (Welch et al. 2004) and very kindly provided by their authors.

**Planning ahead**

2017 is the last EBBA2 fieldwork season and efforts to cover the remaining gaps, as identified within pilot data collations, are done across Europe. The great majority of this work will be organised at the national, regional and local levels, and the international cooperation is promoted by the EBCC. Thus, a proactive approach was taken with regards to the targeted fieldwork effort in critical gap areas. A specific challenge “Filling EBBA2 gaps” was developed in order to motivate birdwatchers across Europe to find and map the gap squares during their travelling abroad. The
challenge has very simple requirements which should lead to increased knowledge on breeding birds in gap squares with the potential for participants to win one of three Meopta binoculars which serves as the basis of motivating them. The challenge is open to anyone and we would like to motivate further people to join in.


By summer 2017 the final data request will be launched. National coordinators will be kindly asked to provide their data (both 50×50 km data and timed visits) in basically the same formats used for the previous pilot data provisions. This process will take some time at national levels and should be finished during the beginning of 2018 in order to keep all the phases of the project well scheduled, including the publication of preliminary maps and their revision. EBBA2 modellers will work hard in 2018 to have 10×10 km maps for as many species as possible by early 2019. This will be a year for writing and finalising all the details of the contents of the final product, leaving layout and printing tasks for 2020, when we will all do our best to have a published book as a Christmas present.

Future work on the Atlas will require substantial human and financial sources. In order to secure funding, we have started a species sponsorship campaign, similar to the model which was applied in EBBA1. People, NGOs, various institutions and companies now have the opportunity to sponsor their favourite species which can help ensure a successful functioning of the project until its publication. At the beginning of April 2017, around 70 species out of 550 were sponsored this way, and we would like to encourage people to continue with their contributions through our campaign. http://www.ebba2.info/support-ebba2/ebba2-species-sponsorship/

Acknowledgements

We thank the community of European ornithologists and birdwatchers that made these new steps in EBBA2 possible. We would like to mention here the national contacts who reported data for the second and third data requests on behalf of many persons and organisations: Taulant Bino & Mirjan Topi (Albania), Clara Pladevall (Andorra), Karen Aghababyan (Armenia), Norbert Teufelbauer (Austria), Elchin Sultanov (Azerbaijan), Anastasiya Kuzmenkova & Alexander Vintchevski (Belarus), Jean-Yves Paquet & Anny Anselin (Belgium), Dražen Kotočan & Jovica Sjeničić (Bosnia and Herzegovina), Stoyocho Stoychev & Svetooslov Spasov (Bulgaria), Vlatka Dumbovic & Tibor Mikuska (Croatia), Martin Hellicar & Christina Ieronymidou (Cyprus), Karel Štastný, Vladimír Bejček & Zdeněk Vermouzek (Czech Republic), Thomas Vikström, Irina Levinsky & Charlotte Moshøj (Denmark), Renno Nellis, Uku Paal & Jaanus Elts (Estonia), Aleksi Lehtikoinen (Finland), Jérémy Dupuy, Bernard Deceuninck, Jean-Philippe Siblet & Frederic Jiguet (France), Guillermo Mayor & Alexander Abuladze (Georgia), Bettina Gerlach, Christoph Sudfeldt & Christoph Grüneberg (Germany), Danae Portolou (Greece), Karoly Nagy, Zsolt Nagy & Tibor Szep (Hungary), Gudmundur Gudmundsson & Kristinn Skarphedinsson (Iceland), Brian Caffrey, Olivia Crowe & Justin Walker (Ireland), Roberto Lardelli, Lorenzo Fornasari & Guido Tellini (Italy), Askar Isabekov & Olga Voltzit (Kazakhstan), Qenan Maxhuni (Kosovo), Viesturs Kerus, Ainars Aunins & Andris Dekants (Latvia), Georg Willi & Peter Knaus (Liechtenstein), Liutauras Raudonikis (Lithuania), Patric Lorgé & Mikis Bastian (Luxembourg), Metodija Velevski & Danka Uzunova (Macedonia), Joanna Mandila & Nicholas Barbara (Malta), Milhailo Jovičević & Darko Saveljić (Montenegro), Kjetil Mork, Ingar Jostein Øien, Paul Shimmings, Magne Husby, John Atle Kålås & Roald Vang (Norway), Tomasz Chodkiewicz & Tomasz Wilk (Poland), Domingos Leitao, João Rabaça & Carlos Godinho (Portugal), Vitalie Ajder, Silvia Ursul, Emanuel Baltag & Larisa Bogdea (Republic of Moldova), Judit Veres-Szászka & Zoltan Szabo (Romania), Olga Voltzit & Mikhail Kalyakin (Russia), Dimitrije Radisic, Draženko Rajković, Saša Rajkov, Slobodan Puzović & Milan Ružić (Serbia), Jozef Ridoň (Slovakia), Tomaž Mihelčič (Slovenia), Juan Carlos del Moral & Blas Molina (Spain), Fredrik Haas, Ake Lindstrom & Martin Green (Sweden), Hans Schmid, Peter Knaus & Samuel Wechsler (Switzerland), Chris van Turnhout & Dirk Zoetebier (The Netherlands), Kerem Boyla, Dilek Sahin & Eylül Dizdaroğlu (Turkey), Justin Walker, Dawn Balmer & Simon Gillings (UK), Igor Gorban & Tatiana Kuzmenko (Ukraine), as well as international on-line portals BirdTrack, eBird, Observation.org & Ornitho, regional sources & foreign birdwatchers, with special mention to Stephan Ernst (Albania), Kai Gauger (Azerbaijan) & Johannes Kamp (Kazakhstan). We also thank our colleagues
in the Atlas Steering Committee, Hans-Günther Bauer, Lluís Brotons, Ian Burfield, Mark Eaton, Ruud Foppen, Mikhail Kalyakin, Aleksi Lehikoinen, David Noble & Iván Ramírez for all the fruitful discussions and continuous support. Our colleagues in the Spatial Modelling Group of the EBCC, Lluís Brotons, Thomas Gottschalk, Jérôme Guélat, Frédéric Jiguet, Alison Johnston, Christian Kampichler, Marc Kéry, Thomas Sattler, Henk Sierdsema, Tomáš Telenský and Nicolas Titeux, are working hard in order to bring their best expertise to 10 × 10 maps. Dani Villero, Marc Anton and David Martí provided key work in the EBBA2 database structuring, without which this first exercise of compilation would have been very difficult. And last but not least we thank a lot thousands of ornithologists and birdwatchers across Europe that are making this atlas possible!

References


Received: 25.04.2017
Accepted: 29.05.2017