Bird Numbers 2019

Counting birds counts

Book of Abstracts

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21st Conference of the European Bird Census Council

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BIRD 2019 NUMBERS
ÉVORA

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Imprint

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Bird Numbers 2019: counting birds counts

The logo of the Conference pictures two species with different stories: the Woodchat Shrike *Lanius senator* and the Dartford Warbler *Sylvia undata*, both occurring in Alentejo. The first is a LC species currently suffering a moderate decline in Spain and Portugal; the second is a resident bird classified as NT which is declining in Europe at a moderate rate and seemingly increasing in Portugal, a country that holds 25% of its European population.

Bird Numbers 2019

Counting birds counts

Évora | Portugal

8-13 April 2019

Book of Abstracts

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FOREWORD

Dear friends and colleagues,

During the past 50 years the former International Bird Census Committee (IBCC), European Ornithological Atlas Committee (EOAC) and from 1992 onwards the European Bird Census Council (EBCC), promoted and organized jointly with national delegates inspiring Conferences all over Europe with a common goal: increase our knowledge on bird abundances and population trends highlighting the role of birds as environmental indicators.

The message blossomed along the years and our current understanding on what is happening to our birds across Europe is huge. But the extent of threats they are facing is not smaller due to an unceasing pressure on European habitats that challenges biodiversity levels and human well-being.

The 21st Conference of EBCC aims to address these issues and endorse them to citizens. The theme of the Conference, *counting birds counts* stresses the importance of bird monitoring for society and also underlines the running phrase of EBCC: *every bird counts*.

Birds do not recognize national borders. Because of this international collaboration is needed to understand changes in bird population and to protect these species. The Conference includes people from 40 countries, not only from Europe but also from North America, Africa and Asia.

We are pleased to welcome you all in Évora for Bird Numbers 2019! The conference programme is full of stimulating talks, workshops, posters and social and cultural events that have been organised for you. The wonderful city of Évora, the magnificence of the venue – *Colégio do Espírito Santo* – and the awesome landscapes of the Alentejo region dressed in spring colours and fragrances will help us to create the perfect atmosphere for a successful meeting.

We acknowledge the contribution of all our partners and sponsors. Without their support this Conference would be unconceivable. We are also grateful to volunteers, experienced young people who will do their best to make your stay among us pleasant and memorable.

We wish you a fruitful April week,

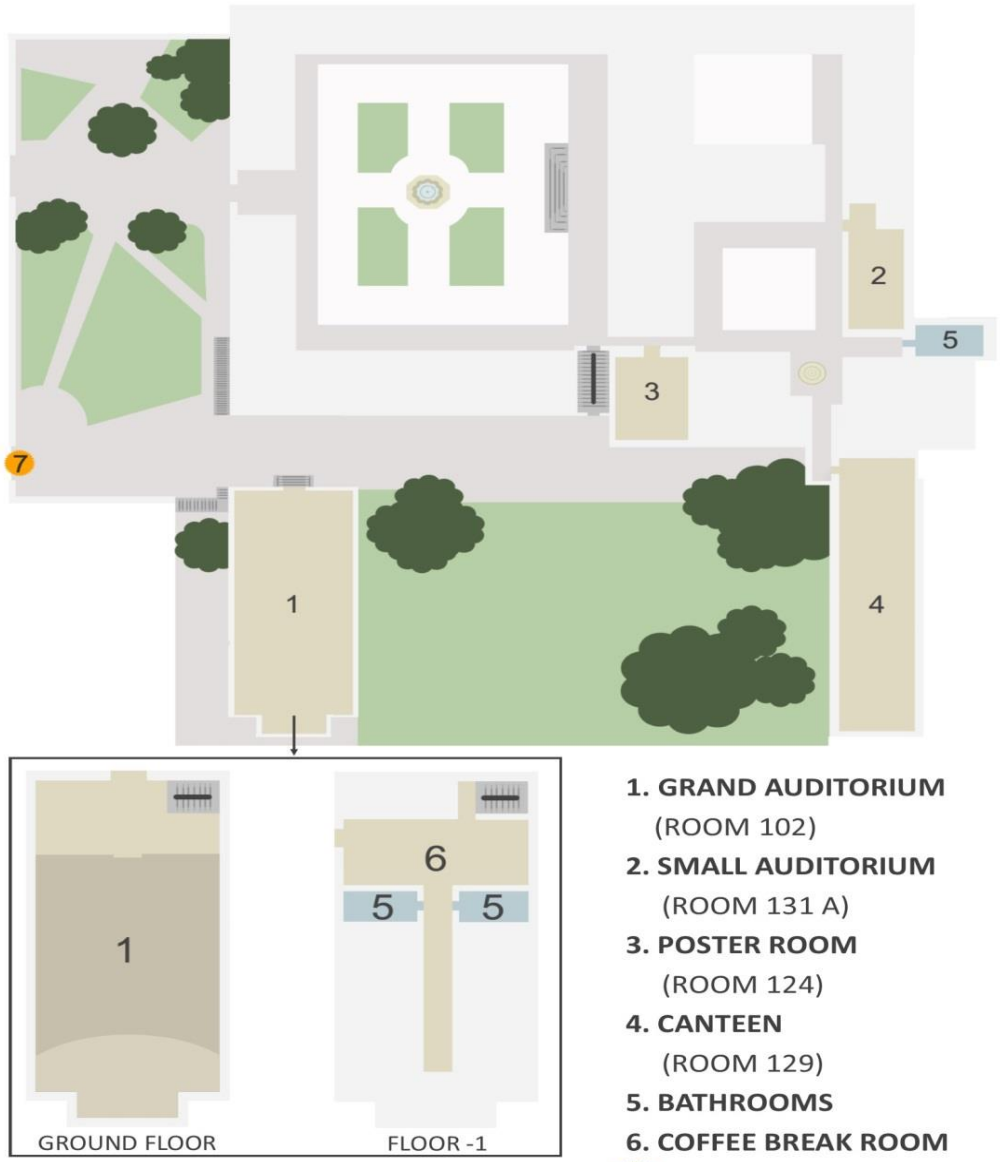
Ruud P. B. Foppen
on behalf of the Board of European Bird Census Council
Aleksi Lehikoinen
on behalf of BirdNumbers 2019 Scientific Committee
João E. Rabaça
on behalf of BirdNumbers 2019 Organizing Committee

GENERAL INFORMATION

Venue

The conference venue is the main buiding of the University *Colégio do Espírito Santo*. All talk sessions, workshops, plenaries, e-posters, breaks and lunches will be there, making it easy and quick to move from one room to another. Please check the final programme at the conference website.

COLÉGIO DO ESPÍRITO SANTO 38°34'22.7"N 7°54'12.9"W



Reception desk & Registration

The reception desk is located on the entrance hall of the Grand Auditorium (**1**; see map in the previous page).

Opening hours:

Monday (8 April) 14:00 - 20:00

Tuesday (9 April) 08:00 – 20:00

Wednesday (10 April) 08:30 – 20:00

Tursday (11 April) closed

Friday (12 April) 08:30 – 20:00

Check Conference website at: www.ebcc2019.uevora.pt

Visit the Conference Facebook page for latest news: https://www.facebook.com/ebcc2019/

Conference e-mail: ebcc2019@uevora.pt

Please visit the Reception desk after your arrival at the conference venue to receive your conference package. Make sure you made a valid registration via the link provided in the conference website (https://sge.uevora.pt) and have paid the conference fee before your arrival.

Internet access

During the conference free Wi-Fi internet access will be available to all conference participants in the university building.

All users who have access to the Eduroam wireless network should preferably use it. If it is not the case, you should connect to FWUE network. The FWUE network is not visible so it has to be added manually. Instructions below are transversal to any operating system (Linux, Windows, iOS, Android, etc.) or device (laptop, tablet, smartphone, etc.).

1) Enable Wireless connection

2) Add manually Wireless Network or Network Profile

3) Configurations:

a. Network Name or SSID: **FWUE**

b. Security: None or No Authentication (Open)

c. Select: Start this connection automatically

d. Select: Connect even if the network is not broadcasting

Once completed the FWUE network connection, you must open the Internet browser. The first time you enter FWUE the Internet access is disabled. When trying to access any page will be redirected to the following page:

The WI-FI credentials for username & password are: ebcc2019. After entering the credentials a second screen appears. It is not strictly necessary to restart the browser; it is only a recommendation to ensure compatibility.

Note: This WI-FI access will only be active during the Conference.

Open Workshop and open plenary

The Workshop and plenary on Monday are open to the general public and can be attended without registration in the conference. Both events will take place at the Grand Auditorium.

Coffee-breaks and lunches

Drinks and snacks will be available during coffee-breaks on the floor -1 of the Grand Auditorium. Lunches on Tuesday, Wednesday and Friday will be served in room 129, the ancient canteen of the University, with two naves and nine spans supporting big marble columns.

Excursions

Mid-conference excursions on Thursday, 11 April will last the whole day. You will have the opportunity to visit remarkable areas of Southern Portugal, from the Tagus Estuary to pseudo-steppe habitats of Castro Verde, see their birds and experience some of the cultural traits of the region.

Departure: 8:00 am (please be there at 7:45) from the parking area at Rossio de São Brás, a large open square at the southern end of Rua da República, near the city's public garden and close to Évora Arena. Assignment of buses will be scheduled on Wednesday, 10 April.

Arrival: 6:30 pm at the restaurant where the conference dinner will take place.

Conference dinner

On Thursday 11 April after mid-conference excursions we invite you to join the conference dinner starting at 18:45 at *Páteo Alentejano*. This restaurant is located in the nearby of the city centre (12' walking from the city walls and close to the sport centre of Lusitano Club). The conference dinner is covered by your conference fee.

Social programme

Time for after work programme is short and even shorter if you consider what the city and its outskirts have to offer. However, we have planned some initiatives that will give you a glimpse over some of the Portuguese cultural heritage. On Tuesday afternoon after the poster session, Companhia das Lezírias will sponsor the Welcome to Portugal side event with wine tasting and Fado concert.

On Wednesday, Fundação Eugénio de Almeida offers to conference participants a free guided visit to the *Paço de São Miguel*, where you can admire beautiful frescoes from the 16th century depicting mythological motives and birds. The visit is scheduled around 6 pm and the Palace is very close to *Colégio do Espírito Santo*.

Fundação Eugénio de Almeida also offers free visits to the *Casas Pintadas* (Painted Houses, close to the Roman temple), an open-vaulted gallery with frescoes also from the 16th century showing several animals. Visits to *Casas Pintadas* can be done from Tuesday to Sunday from 10 am to 6 pm, and all you have to do is showing your conference badge at the reception of Forum Eugénio de Almeida, the Centre of Art & Culture located in front of the Roman temple.

Pre- and post-conference meetings

The Meeting of the Atlas Steering Committee on Sunday 7 April will occur in room 242 (the Senate room, located in the 2nd floor of Colégio do Espírito Santo). The workshop International Waterbird Census on Saturday 13 April will be held in the small Auditorium. The Mediterranean Waterbirds Network will meet at the Senate room on Saturday 13 April afternoon and will continue on Sunday. Please consider separate announcements disseminated by the responsible conveners.

Notes for speakers

Speakers are required to take good note of the following recommendations:

Oral presentations will be 12' long followed by 3' for discussion. The projection systems in both Auditoriums can support 16:9 (widescreen) and 4:3 (standard) aspect ratios. Please prepare your final presentation in one of these two formats.

In order to facilitate the organization, we kindly ask the authors to send their final presentations by e-mail until 7 April (in ppt, pptx or PDF) to ebcc2019@uevora.pt with the subject: author_session (example: GODINHO_2B).

No content of presentations will be shared. The organization will delete all presentations from e-mail and from computers after the BIRD NUMBERS 2019 Conference.

Plenary talks will be video recorded and made available later on in the Conference website. We are grateful to our guests for allowing the recording of their lectures.

Notes for E-posters submitters

BIRD NUMBERS 2019 will use E-posters for the first time in EBCC conferences! Therefore, you will save paper, time for printing and you don't have to carry it along with you. E-poster presentations will be showed on digital screens during the congress and NOT on a regular poster board.

Detailed instructions for E-poster submission are available on the Conference website. Posters' orientation is vertical (57.165 cm x101.64 cm) and should be send by e-mail to eslidesk@tecnovisao.com (with Cc to ebcc2019@uevora.pt) until 3 April. The recommended e-mail subject is: POSTER_EBCC2019_author (example: POSTER_EBCC2019_GODINHO).

We will have 4 touch screens in the Conference poster room (room 124). The E-poster system allows you to search presentations by: Authors name, Abstract and Title.

The uploaded E-poster should contain the same title, order of authors and affiliation details as the submitted abstract.

Proceedings

The Proceedings of BIRD NUMBERS 2019 Conference will be published in AIRO journal, a peer-reviewed scientific journal published by the Portuguese Society for the Study of Birds (SPEA). We encourage all authors (including poster authors) to submit your papers.

Deadline for manuscript submission: 31 May 2019.

Publication of Proceedings is schedule to December 2019. Please check instructions for authors here: https://www.airo-spea.com/instructions

The manuscript should be submitted by e-mail to ebcc2019@uevora.pt with a mandatory subject on e-mail message: AIRO_submission_author.

Emergency phone codes and usuful numbers

Emergency doctor and fire brigade: 112

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Évora Hospital: +351 266 740 100

Taxi: +351 266 734 734

THE ROAD TO TRAVEL: FROM POPULATION LEVEL STUDIES TO FUNCTIONAL ECOLOGY AND CONSERVATION

Jaime A. Ramos

MARE – Marine and Environmental Sciences Centre, Department of Life Sciences, University of Coimbra, 3030-167 Coimbra, Portugal (jramos@uc.pt)

Most ornithologists start their career by counting birds. Indeed, bird counts form the basis of many research, conservation and environmental management programs. Understanding the drivers behind changes in bird numbers promotes ecological understanding and more effective conservation measures. In this talk I will present three examples of studies in my research group that began with population estimates and worked their way towards functional ecology and conservation.

The Priolo, *Pyrrhula murina*, is an endemic bird species of S. Miguel Island, Azores, and an umbrella species for the conservation of the laurel forest. As the research progressed from a description of population numbers and diet towards a scenario of the Priolo as a disperser of ferns, new ecological value was added to this species and its habitat, a deeper understanding of the negative effects of invasive species was possible, and all this opened up a new window for research.

Unraveling breeding numbers of Little terns, *Sternula albifrons*, (a Vulnerable species in Portugal) in the Algarve to promote their conservation at the regional-scale, habitat-scale and colony scale. At the regional scale oceanographic variation (measured mostly as sea surface temperature anomaly) explains annual changes in breeding numbers. However, annual changes in breeding numbers at a colony-scale and habitat-scale (sandy beaches vs salt-pans) are explained by a negative relationship between vegetation cover and predation. This enabled us to understand the mechanism of abandonment of colony-sites and allowed us to appreciate more fully the importance of mixed species colonies for coastal shorebirds. Anthropogenic habitats such as salt-pans may be particularly useful for breeding shorebirds if the mixed colonies include adequate numbers of species with mobbing behaviour.

In last, I will talk on the role of Cory's shearwaters, *Calonectris borealis*, breeding on Berlenga Island, Portugal, and Roseate Terns, *Sterna dougallii*, breeding on Aride Island, Seychelles, as sentinels of oceanographic changes. As we ventured into explaining annual changes in breeding numbers and foraging behaviour of these two species we developed an appreciation for their role as 'sensitive' proxies of climatic variation and marine productivity. During the pre-laying period (April-May), and when marine productivity proxies in the foraging areas around Berlenga decreased noticeably (i.e. an increase in Sea Surface Temperature and a

decrease in Primary Productivity) female Cory's shearwater responded by travelling farther, even exploiting the productive Grand Bank and Newfoundland Shelf, off Canada (about 4000 km from Berlenga), and thus connecting the two sides of the Atlantic Ocean. The productivity of Roseate terns on Aride Island responds markedly to changes in food conditions determined by changes in Sea Surface Temperature around the colony, which makes them good sentinels of oceanographic changes, and also of the productivity of other tern species.

If we explore the full potential of our data on bird numbers we may start to give appropriate weighting to both the conservation of ecological patterns and ecological processes. This should be an important way forward to deliver a deep and strong conservation message for stakeholders.

IMPORTANCE OF BIRD DATA FOR EU NATURE POLICIES – PAST, PRESENT AND FUTURE

Frank Vassen

European Commission, DG Environment, Unit ENV.D.3 (Frank.VASSEN@ec.europa.eu)

There is a continuous need for collecting data on bird populations across the European Union (EU) territory in relation to the EU Biodiversity Strategy and the EU Birds Directive, but also for other EU policies, such as the Common Agricultural policy. The most relevant datasets in this regard are the national reports on population size and trends of European bird species, which Member States report on a 6-yearly basis for all species (reports under Article 12, Birds Directive), and the Pan-European Common Birds Monitoring Scheme (PECBMS), which is updated on an annual basis but only covers the more common species. Both datasets have an important and complementary policy function.

Furthermore, the management of the Special Protection Areas (SPAs) within the Natura 2000 network also requires bird monitoring data, to highlight the key importance of the sites and to properly document the effectiveness of conservation measures taken for these sites. Natura 2000 currently encompasses nearly 28.000 individual sites, covering 18% of the EU land area and almost 9% of its marine territory. The network of sites is considered as nearly completed in its extent, but it is not yet properly managed and monitored everywhere.

For those bird species for which SPAs have been designated (species listed in Annex I of the Directive and certain other migratory species), Member States report on the species' population sizes per site using a Standard Data Form. However, not much is known about the site-specific data collection effort or on the frequency of updating relevant bird data in these forms. Some of the reported data is clearly out of date, showing that there is still an opportunity for improving basic data collection on the SPAs. This is an area which would benefit from more targeted monitoring and reporting, particularly in determining the efficacy of management of the sites.

The recent fitness check of the EU Nature Directives concluded that the Directives are still fit for purposes, but that implementation efforts must be stepped up to achieve the overall objective of a good status of all bird species in the EU. One of the priorities of the follow up Action Plan on Nature, People and the Economy is to improve knowledge through enhanced and more efficient monitoring and by ensuring public online access to data necessary for implementation for the Directives. Some of the actions under this plan (such as the ongoing updating of migration dates/key concepts on huntable species) are benefiting from recent birds data. Others (such as the emerging work on satellite databased land use tracking in the frame of the Copernicus programme) may soon help improve our understanding of species trends and the effectiveness of conservation measures taken.

While all indicators show that the overall trends in many bird species are still negative, a recently published study on the drivers of a successful implementation of the Birds and Habitats Directives reminded us that there are also examples of positive trends in species, some of which clearly attributable to active management and restoration efforts undertaken.

None of these encouraging findings would have been possible without an appropriate monitoring effort accompanying the actual conservation measures on the ground.

The conservation of nature and biodiversity in the EU it is very much dependant on the awareness of and support of its citizens. More than any other group of species, birds are critical in this respect, as they enjoy a high level of popularity amongst people. Furthermore, as you all know, the engagement of individuals in nature conservation often starts with the recording of bird observations in one's own backyard.

Recently, citizen science portals are becoming increasingly important as a support to the emergence of young naturalists. There is no doubt that these portals are not only providing new ways of engagement, they also offer new and important opportunities for generating and exploring policy-relevant data, some of which we have already been testing and others we are only still discovering collectively and that are to be discussed during this conference.

Thanks to a dedicated LIFE project, DG Environment was happy to support the development of the European Bird Portal during the last 3 years. The data gathered by volunteers on the migration of birds across our continent illustrates more than any other nature information the value and need for a common European effort on the conservation of our natural heritage. We are looking forward to further cooperation in the field of bird data collection in the coming years.

DISEASE AS A DRIVER OF WILD BIRD POPULATION DECLINES – HOW DO WE QUANTIFY THE IMPACT?

Becki Lawson

Institute of Zoology Zoological Society of London, Regent's Park, London NW1 4RY UK (Becki.Lawson@ioz.ac.uk)

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Disease is a recognised threat to endangered species and those, such as island endemics, that are geographically isolated and immunologically naïve, leaving their populations vulnerable to novel pathogens. Indeed, examples of wild bird species extinctions due to disease, in combination with other ecological threats, exist from multiple countries.

Studies evaluating the contribution of disease to species declines note the need to improve wildlife disease surveillance programmes in order to generate baseline data on disease prevalence. In recent decades there have also been several well-documented examples whereby disease emergence and subsequent wild bird mortality has led to marked population declines of previously common species, over a wide geographical range and within a relatively short time frame. Integration of data from surveillance and longitudinal population monitoring, encompassing both the period before and following disease emergence, has enabled quantification of disease impact at a population level.

Scanning (or general) wildlife disease surveillance schemes, with a broad remit to detect the range of infectious and non-infectious disease threats, are typically reporter-led and rely on soliciting observations of sick or dead wildlife for investigation. Citizen science offers a powerful and structured tool to achieve this form of surveillance, and is particularly well-suited to charismatic, synanthropic species that are frequently observed and positively-perceived by the general public.

Garden Wildlife Health (GWH) is an example of such a citizen science scheme and is co-ordinated by a team of veterinarians at the Zoological Society of London, working in collaboration with scientists at the British Trust for Ornithology (BTO), Royal Society for the Protection of Birds, and Froglife. Opportunistic reports of sick or dead garden birds, birds of prey, amphibians, reptiles and hedgehogs, are sought from members of the public across Great Britain and captured online (www.gardenwildlifehealth.org). Freshly dead wild animal carcasses are submitted from a subset of incidents for post-mortem examination, following standardised protocols, conducted to identify the cause of death and to detect presence of underlying conditions. A comprehensive tissue and pathogen archive is collated from all examinations, forming a valuable national resource to facilitate further studies.

In addition, circa 3,000 participants in the BTO's Garden BirdWatch survey provide weekly reports throughout the calendar year, recording the wildlife seen in their gardens and any potential signs of ill health. This systematic dataset enables structured analyses that account for observer effort and can be used as a control for reporting bias. Nevertheless, detection bias will influence submissions to any citizen science scheme, meaning that submissions represent a non-random sample that does not necessarily reflect the composition of actual causes of wildlife mortality.

Finch trichomonosis and Paridae pox are two examples of infectious diseases that have emerged in Great Britain since 2005, affecting Fringillidae and Paridae species respectively. Surveillance data from GWH, analysed in combination with various garden-based population monitoring datasets and annual breeding bird surveys across habitat types, has enabled assessment of the population-level impact of these diseases. Finch trichomonosis has caused a decline of the UK breeding Greenfinch (Chloris chloris) population sufficient to classify this species as Endangered in the UK using the IUCN extinction risk criteria. In contrast, whilst Paridae pox adversely impacts Great Tit (Parus major) welfare, with reduced individual survival and reproductive output, only a small scale population decline has occurred in the UK in recent years, the cause of which remains uncertain but may include ecological factors and/or disease. The methods and analyses used to investigate the epidemiology and impact of these conditions will be presented.

ENGAGING INDIGENOUS PEOPLE IN BIRD MONITORING

Daniel Burgas

Global Change and Conservation, Department of Biosciences, University of Helsinki, P.O. Box 65, FI-00014 Helsinki, Finland (daniel.burgasriera@helsinki.fi)

Although birds are the best studied group in the world, and we hold extensive knowledge of birds' distribution across the globe, knowledge on bird abundances remains patchy or deficient in multiple areas, often coinciding with species rich biomes. This is partly due to biases in the exploitation of typical citizen contributions to collecting bird data in the developed part of the world. However, such potential contributions are untapped in most of the developing countries, where often bird faunas are diverse, and local people have livelihoods that largely depend on natural resources, placing them in daily contact with nature.

I will discuss the theoretical context of participatory monitoring with indigenous peoples, providing examples from around the world making emphasis on the African context. I will give a brief perspective of bird-club initiatives in Africa that are contributing to fill this gap, and will go deeper into challenges and opportunities with a case study in Lake Turkana (N Kenya), an Important Bird Area along one of the principal migration routes of palearctic wintering birds in Africa, and particularly notorious for hosting high abundances of water birds. This is a bottom-up enterprise requested and celebrated by locals, in which we facilitate tools to active and interested members of the indigenous societies for learning and monitoring birds and wildlife at large. We do so by training a selected group of local volunteers to coordinate their own bird club and we provide basic material (e.g., binoculars, field guides). We take advantage of existing database systems for citizen science used in Africa (www.birdlasser.com) to record and submit observations from bird counts to National coordinators. I will also describe the several challenges of running such initiative and the possibilities of scaling it up.

An additional but important aim of this project is to promote positive interactions between key players in conflict in this area. In this line, we make the link between local club members and officers of Sibiloi national park to facilitate regular, coordinated visits of the locals to parts of the national park where high abundances of wildlife are in contrast with areas outside of the park. Also, the passion for birds can promote the links between opposed sectors of the local societies.

On the premise that knowledge brings caring, enhancing knowledge of wildlife reinforces the bonding of societies to the natural world with brighter prospects for conservation. Promoting passion of indigenous societies for birds it not solely brings brighter prospects for bird monitoring, but also for conservation.

THINKING BIG: EBCC'S FUTURE IN DEVELOPING CITIZEN ORNITHOLOGY AT A CONTINENTAL SCALE

Ruud Foppen

SOVON, Dutch Centre for Ornithology, The Netherlands, EBCC, European Bird Census Council and Department of Animal Ecology and Ecophysiology, Institute for Water and Wetland Research, Radboud University, 6500, Nijmegen, The Netherlands (ruud.foppen@sovon.nl)

We live in a big data era. Huge quantities of data are collected by apps on smartphones and other mobile devices. Also nature observationists use these easy tools to enter observations. Bird watchers collect millions of records each year and there is hardly any taxonomical group that has such good coverage over species, space and time. Nowadays these activities are often regarded examples of citizen science. But the question can be asked whether many of them deserve the science label. Although their use to unravel biological patterns and describe i.e. ecological phenomena seems obvious and promising, analysing and soundly interpreting these data is not as straightforward as it might look.

That said, I think EBCC and its partners conducted genuine citizen science long before the term was introduced. I advocate that the EBCC projects are among the world's largest and best examples of citizen science. EBCC and its partners show plenty of examples of good scientific use of these data and I will share with you some very nice examples around Europe. It is remarkable and unique that all projects we started as EBCC are a major success. In my talk I will address the important key factors for this success. One of them certainly the sheer size of the network with many thousands of voluntary contributors: our observers. I will briefly go back in time and describe the historical context of how EBCC was founded and why the governance model was so important.

So, what is the future of EBCC, what lay ahead of us? I will discuss some of the opportunities and sketch some excellent options for the near future. As we collect different types of data we should appreciate also the value of an integrated approach in analysing the various sources also incorporating datasets outside our own EBCC network. We hardly have begun to explore this.

It is worthwhile to spend some time discussing the kind of questions and topics that we can/could address with a focus on nature policy and conservation.

ORAL PRESENTATIONS

SESSION A1 – POLICY

USING STANDARDISED EBBA2 DATA ON FARMLAND BIRDS TO INFORM EU POLICIES

Petr Voříšek, Sergi Herrando, Verena Keller, Martí Franch, Marina Kipson, Pietro Milanesi

PV, MK: Czech Society for Ornithology, Czechia (euromonitoring@birdlife.cz); SH, MF: Catalan Ornithological Institute, Spain; VK, PM: Swiss Ornithological Institute, Switzerland

Population trends of European birds have been used successfully as indicators of the state of biodiversity in the EU and at national level. However, information on the spatial dimension should complement the information on species population trends. This is important particularly for farmland birds which declined dramatically in Europe in the last few decades. From 2013 till 2017, volunteers across the whole of Europe have collected standardised data for the second European Breeding Bird Atlas (EBBA2) at a scale of 10x10 km squares. These data are used here to project and explore farmland bird species richness maps based on the models developed with a resolution of 10x10 km. Species richness is presented for the set of species used for the Farmland Bird Indicator in Europe. Farmland species listed as threatened on the European Red List of Birds are used to visualise squares with high conservation value for farmland birds.

This approach will enable policy makers to visualise occurrence "hotspots" of farmland bird species, and in contrast, which areas are in most need for conservation actions in order to improve the overall status of farmland birds. The use of the EBBA2 standardised dataset therefore provides a great opportunity to inform policy makers on various types of analyses that can be done with this dataset on European level, and to improve our current understanding of where conservation action is needed.

HIGH RESOLUTION BREEDING BIRD ATLAS AS A TOOL FOR PRIORITIZING CONSERVATION ACTIONS: AGRI-ENVIRONMENT SCHEMES ADEQUACY TO FARMLAND BIRD CONSERVATION IN WALLONIA

Jean-Yves Paquet, Arnaud Laudelout, Thomas Coppée, Jérémy Simar, Antoine Derouaux, Thierri Walot, Marc Dufrêne

J-YP, AL, AD: Département Études, Natagora, Traverse des Muses 1, B-5000 Namur, Belgium (jean-yves.paquet@aves.be); TC, MD: Biodiversity and Landscape Unit, Gembloux Agro-Bio Tech, University of Liège, Belgium; JS: Département d'Etudes du Milieu Naturel et Agricol, Service Public de Wallonie, Bernissart, Belgium; TW: Earth and Life Institute, Université Catholique de Louvain, Louvain-la-Neuve, Belgium

Breeding bird abundance maps were compiled at the resolution of 1x1 km for Wallonia, a Belgian region of 16.500 km² with a gradient from urban and intensive farmland environment to semi-natural grasslands and forest-dominated landscapes. Using a combination of modelling and data extraction techniques, we map the entire breeding avifauna with a few exceptions such as nocturnal species. For widespread species, spatial modelling from sampling count transects and detailed information on land cover was applied. For rarer species, data from specific census were used when available, together with casual observation from observation.org, a popular bird data portal.

The resulting high resolution global map is a tool for assessing the adequacy of conservation actions with biodiversity pattern. It could also be used to prioritize actions for conservation. Here we test the adequacy of agri-environment scheme (AES) spatial repartition, or territorial tools like protected areas, with farmland and grassland bird distribution, and we elaborate on quantitative objectives for biodiversity regarding birds in Wallonia for the next 2021-2027 Common Agricultural Policy period.

WINTERING WATERBIRDS´ IMPORTANT SITES FOR SPECIES PROTECTION AND IN THE LIGHT OF THE CONFLICT SPECIES ISSUE

Zuzana Musilová, Petr Musil, Petra Šímová, Jan Zouhar, Igor Krejčí, Jan Rydval, Matyáš Adam, Šárka Neužilová, Adéla Šenkýřová, Ondřej Langer, Jiří Prošek, Karel Šťastný

Faculty of Environmental Sciences, Czech University of Life Aciences in Prague, Czechia (musilovaz@fzp.czu.cz)

The functional important site network is essential for the species conservation. However, recent climate and environmental changes drive the species distribution that could lead to the decrease of protected network efficiency as well as the increase of possible human-bird conflicts. Here, we present the project that aims to develop a complex and integrated methodology for the identification of important wintering sites network for waterbirds based on annual waterbird monitoring data (mid-January International Waterbird Census) and quantitative models of species distributions and interactions between biotic and abiotic site characteristics. Habitat suitability models (HSM), system dynamics models and methods of multi-criteria evaluation of variants will be used to evaluate the pattern in waterbirds distribution and site characteristics (habitat and climatic variables and site human-induced regulation measures). In addition, the project aims to design a new methodology to detect wintering sites where nature conservation goals conflict with the interests of commercial subjects in the industries of agriculture and fishery.

The subjects of special conservation measures are Annex I species while subjects of potential conflict are fish-eaters (Great Cormorant *Phalacrocorax carbo*, Grey Heron *Ardea cinerea*, Great-white Egret *Ardea alba* and Goosander *Mergus merganser*) and herbivores (Greylag Goose *Anser anser*, White-fronted Goose *Anser albifrons* and Bean Goose *Anser fabalis*).

CLIMATE-DRIVEN CHANGES IN WATERBIRD ABUNDANCES IN EUROPE AND NORTH AFRICA. ARE PROTECTED AREAS AND IBAS KEEPING UP?

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Evidence is accumulating that avian species, and particularly waterbirds, are responding to anthropogenic pressure and climate change by, inter alia, changing their distributions. This ongoing process raises a question about the effectiveness of the current international network of protected areas accommodating such fast and large-scale changes. Using 26 years of data on waterbird winter abundances (International Waterbird Census), we investigated the (i) link between site abundance and local winter temperature as well as potential geographical differences across Europe and North Africa, and (ii) inter-annual and long-term shifts in the centroid of species' wintering ranges (winter centroid) and changes in large-scale winter weather conditions (NAO). Furthermore, we (iii) estimated trends in abundances in a WSW – ENE gradient and compared these inside and outside both the international network of protected areas (PA) and the IBAs. Here, we present results showing a strong link between site waterbird abundance and local winter temperature but contrasting spatial differences across Europe and North Africa. We also show that the year-to-year variation, as well as long-term shifts in the winter centroid are associated to changes in the winter NAO but this relationship varies between groups of species exploiting different habitats during winter (i.e. deep waters, shallow waters and farmland). Lastly, we provide evidence on spatial differences in the abundance trends inside the PA and IBA networks across Europe and North Africa and suggest that further designation of IBAs as PAs would enhance the effectiveness of the current international biodiversity conservation strategy under ongoing and future environmental change.

TRENDS OF MEDITERRANEAN GRASSLAND BIRDS UNDER LAND USE AND CLIMATE CHANGES

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Climate and land use changes are major threats to biodiversity on farmland. Mediterranean grasslands support many threatened bird species, and are likely to experience the greatest proportional change in biodiversity under future scenarios of change. Understanding how climate and land use interact to shape biodiversity is thus crucial to develop management strategies to improve grassland sustainability and resilience to environmental change. Here, we analyse how variation in climatic conditions interacts with land use to shape bird community composition in Mediterranean grasslands. We surveyed breeding birds in the Special Protection Area of Castro Verde, southern Portugal, through 391 5-min point-counts in spring 2006, 2011 and 2017. Sampling covered a period of changes in agricultural land use, with increased cover by pastureland and declines in cereals and fallow fields, and major variations in climatic conditions, involving a severe drought in 2005.

Results show strong temporal variations in bird occurrence related to changes in both climate and land use. The highest occurrences of species associated with sparse vegetation and bare ground such as Black-eared Wheatear *Oenanthe hispanica* and Greater Short-toed Lark *Calandrella brachydactyla* were registered in 2006, the year after the drought. In contrast, the occurrence of species associated with taller and denser vegetation such as Zitting Cisticola *Cisticola juncidis* and Common Quail *Coturnix coturnix* reached the lowest values in 2006, while being more frequent in 2011 than in 2017, probably reflecting cereal area reduction and grazing pressure increase. Results suggest that increases in the frequency and intensity of drought events due to climate change combined with grazing intensification may have consequences on grassland bird community composition, by drying prematurely the vegetation and consequently limiting feeding and breeding conditions for grassland specialized bird species, while increasing habitat suitability for species associated with drier landscapes with scarce vegetation.

SESSION 1B – METHODS: SPATIAL ANALYSES

ELEVATION SHIFTS IN THE SWISS BREEDING BIRD COMMUNITY: TEASING APART CLIMATIC AND HABITAT EFFECTS ON THE DISTRIBUTION DYNAMICS

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Predicting the distribution of species remains a challenge, particularly when ranges are changing. In these cases dynamic models allowing a mechanistic modeling of the underlying causes of occupancy change, i.e. colonization and extinction events, may provide a better framework to analyze distribution changes over time. We combined four disparate datasets (two breeding bird atlases and two common breeding bird survey schemes) in a single modeling framework to identify elevation shifts and drivers of the distribution dynamics of the community of Swiss breeding birds over 25 years. We used dynamic site occupancy models which allowed us to explicitly express occurrence changes as a function of colonization and persistence processes while accounting for imperfect detection. These models provide an explicit way of modeling the observation process. It was thus possible to rigorously account for the differences in the sampling protocols and in the observation intensity during the whole study period. We used climatic and habitat covariates to model the colonization and extinction probabilities to investigate possible effects of land-use and climate changes.

We first looked for elevation shifts in the distribution of 97 common species and found that 42 species increased their average occupied elevation during the last 25 years. Most of them were alpine or forest species. In a second step we quantified the relative importance of habitat and climate on the dynamics. Climate appeared to be a slightly more important driver of colonization while the results were less clear for extinction, except for alpine species for which habitat played a larger role.

MODELLING THE DISTRIBUTION OF BREEDING BIRDS FOR THE SECOND EUROPEAN BREEDING BIRD ATLAS EBBA2

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One of the main aims of the Second European Breeding Bird Atlas (EBBA2), promoted by the European Bird Census Council (EBCC), is to model the distribution for as many European breeding bird species as possible. As a basis, we use a dataset of more than 900,000 records of more than 500 breeding bird species detected during more than 35,000 standardised surveys carried out in the period 2013-2017. Modelling the distribution of breeding birds for the whole of the European continent is challenging and requires the implementation of robust procedures at different steps of the process to provide accurate map of species distribution, while taking into account several factors related to data collection and structure. Actually, data collection could have been strongly affected by the choice of the sampling method and the time spent during the surveys as well as the period in which they were carried out.

Here we show how we model breeding bird distribution in the context of EBBA2, relating species presence/absence data with 40 environmental predictors, accounting for species' imperfect detection (estimated through the above mentioned factors related to data collection) and including spatial autocorrelation of species records. Our approach is the result of an intensive process in collaboration with experts from the EBCC Spatial Modelling Group, in which several options were tested and compared to provide the most accurate estimates of bird distribution. We believe that our approach could be useful not only for EBBA2 but for other atlas projects.

A HIERARCHICAL BAYESIAN SPECIES DISTRIBUTION MODEL (SDM) FOR COMMON SCOTERS IN DUTCH COASTAL WATERS

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Common Scoters *Melanitta nigra* use the shallow Dutch coastal waters in considerable numbers for wintering and stopover during migration (12,000-59,000 winter/migration numbers, 2009-2014). Common Scoters feed on particular epibenthic shellfish species (*Spisula* spp: surfclams, *Ensis* spp: jackknife clams). For a marine nature reserve (Nature 2000) area in the southwest of the Netherlands a hierarchical Bayesian SDM is constructed for Common Scoters. The modelling is based on four years of bimonthly counts in winter, large scale yearly monitoring of benthos (ingestible biomass), dynamic data on water velocity at the seafloor, dynamic data on human disturbance through marine traffic (expressed in percentage mean daily disturbance hours per 24 hour) and static seafloor depth data. Several models were developed taking into account all the mentioned covariates and dealing with spatial autocorrelation and the zero-inflation of the scoter data. Statistical modelling is done in r-INLA. Based on statistical model evaluation incorporation of spatial correlation structure is improving the results considerably.

The modelling shows that the distribution of Common Scoters in the study area is to a large extent influenced by disturbance by marine traffic, besides natural covariates as food availability and to a minor extent by water velocity at the seafloor and seafloor depth. Reducing the disturbance by marine traffic below 5% can increase the numbers of Common Scoters six fold. The modelling framework allows for the exploration of scenario studies to manage areas influenced by disturbance through marine traffic, this has already resulted in an enlargement of existing exclusion (of human activities) zones in the Natura 2000 area.

MAPPING HOTSPOTS FOR BIRD BIODIVERSITY

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Information on the distribution of birds is used for a wide variety of purposes in nature management and policy. Especially the recent generations of bird atlases provide detailed information on the distribution of birds. But also other sources of data like monitoring data can be used to make detailed distribution and abundance maps. Although all these individual species maps are very valuable, it is not easy to get insight in the general biodiversity value for birds or the value for bird species characteristic for particular habitats. This issue can be solved by combining the individual species maps into hotspot maps. We will show how various types of distribution maps can be combined into hotspot maps. In the last ten years we have made these kind of maps for a wide variety of purposes. These range from getting general insight into regional biodiversity values up to providing provinces with the information they use for setting priorities in agri-environment schemes.

HIGH RESOLUTION MAPPING OF POPULATION DYNAMICS IN BREEDING BIRDS IN WALLONIA (SOUTHERN BELGIUM)

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Patterns of fine-scale changes in bird abundances across different landscapes may inform us about the driving forces behind bird communities' evolution. We compare two maps, with a resolution of one square kilometer, of breeding birds in Wallonia (Southern Belgium) at 10 years intervals. The maps are based on repeated sampling transects conducted inside a km²-grid. Spatial modelling techniques were applied on these two datasets using environmental variables produced by the LifeWatch-WB Project. Variables are issued from pixel-based land cover classifications based on orthophoto mapping and satellite images, with a resolution of 2 meters and are available for the two periods corresponding to the bird data. Others variables, besides the land cover classification, that were included in the model are climatic, topographic or concern soil attributes. For each bird species, spatial models built with data from the first period are projected with the value of the environmental variables for the more recent period, and vice-versa. Modelling methods mainly are of two types: Generalized Additive Model (GAM) or RandomForest. Models quality is measured with different indices. Comparison between prediction and real data at the square kilometres level offers insights about the causes of change in bird populations.

SESSION 2A – MANAGEMENT + ECOLOGY

MONITORING IN THE CONTEXT OF THE AEWA EUROPEAN GOOSE MANAGEMENT PLATFORM

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The AEWA European Goose Management Platform (EGMP) is established to provide mechanism for a coordinated and inclusive decision-making and implementation process for the sustainable management of goose populations in Europe, with the objective of maintaining them at a favourable conservation status, while taking into account concerns of relevant stakeholders and the pertinent legislative frameworks and regulations. Action plans developed under the EGMP are currently in place for the Svalbard population of the Pink-footed Goose *Anser brachyrhynchus* and the Taiga Bean Goose *Anser fabalis fabalis*, whereas action plans for the three populations of the Barnacle Goose *Branta leucopsis* and the NW/SW European population of the Greylag Goose *Anser anser* are under development. For the two species where action plans are being implemented, Adaptive Management plans are in operation. A key component in all applications of Adaptive Management is monitoring, which provides information to estimate resource status, informs decision-making, and facilitates evaluation and learning after decisions are made. In this presentation, we will give an introduction to the EGMP and the Adaptive Management process, with focus on the monitoring needs. This will happen through working examples from the Adaptive Management plans in operation under the EGMP, thus include examples of the two species, Pink-footed and Taiga Bean Goose, where monitoring is already operational.

INFLUENCE OF BIRD TRAITS ON THEIR RESPONSES TO FOREST STRUCTURE

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Forest structure, as resulting from management practices, have an effect on habitat quality and thus the occurrence of birds using and depending on these landscapes. We hypothesized that the species responses to forest structure is influenced by their ecological traits. The aim of our study is thus to examine the relationship between bird traits and their responses to forest structure, with a case study in the Canton of Zürich (Switzerland). For this purpose, we used occurrence data derived from the Zurich breeding bird census of 2008, forest inventory and climate data for the same regions, as well as a trait database for the studies species. We used a multispecies predictive trait model based on a Lasso GLM to identify critical response traits and to quantify their relationships to species' responses to forest structure, landscape configuration and climate.

Finally, and based on our results, we conclude by giving general forest management recommendations for the promotion of forest bird diversity. This work is part of the BiodivERsA project GreenFutureForest.

THE RESPONSE OF TEMPERATE FOREST BIRD COMMUNITIES OF ISTRANCA MOUNTAINS TO DECADAL FORESTRY ACTIVITIES

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Forests in temperate regions have been extensively managed for timber production and associated services. Consequently, forestry activities have modified large forested areas with potential cascading effects on diversity and composition of forest bird communities. We used long term inventory of forestry activities and breeding bird atlas data across 12,000 km^2 forested area in Istranca Mountains, Thrace, Turkey to assess the effect of forestry activities on bird communities. The Istranca Mountains are largely covered by forests, which have been subject to forestry both in the forms of clear cutting and stand management. The breeding bird atlas survey was conducted in April-June 2009 at 443 locations using 10 min standardized counts, where abundance and breeding evidence of each bird species was recorded. Overall, 177 bird species were recorded during the survey and 67 bird species were breeding in the forest habitats. The forestry activities across the Istranca forests were compiled and digitized from official forestry registry forms covering the entire production cycle before the survey (1999-2009). Furthermore, the forest stand structure was quantified during the breeding bird survey at each sampling site. The abundance, diversity and composition of forest birds were analysed in relation to the intensity and date of forest production as well as the consequent forest stand structure.

The breeding bird diversity and community structure strongly responded to the forestry activities, especially to the resulting forest stand structure. The monotonous stands with less habitat diversity and plantations hosted the least diverse breeding bird communities. Forest patches that were not subject to clear cuts and managed with conservation priorities had a distinct and diverse bird community. Specifically, the old swamp forests hosted the highest breeding bird diversity. The results highlighted the importance of forest stand management that prioritises protecting the stand diversity and age for forest bird communities.

EFFECTS OF FINNISH ENVIRONMENTAL IMPACT ASSESSMENT PROCESS ON BIRDS

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Environmental Impact Assessment (EIA) is a systematic planning tool and fixed by law. During EIA the effects of major projects on their utilized environment are examined and most importantly, it aims to reduce or to totally prevent the negative impacts of projects on environment. In Finland, EIA is in general applied to all large-scale construction projects and surveys of biodiversity are conducted at the pre-construction state, whereas the post-construction monitoring of biodiversity is sporadic and its implementation differs between project types, resulting in potential loss of biodiversity and information. In this ongoing research we study how the different construction projects affect bird diversity and populations and on which time scale, and how the Finnish EIA procedure could be improved. Data has been collected from EIA reports, environmental permissions licensed to projects and monitoring programs of projects. Furthermore, species composition and numbers of birds before and after project construction are studied by repeating surveys on particular project sites. Also, the trends of bird populations will be related to those of surrounding areas, where project impacts do not reach using national line transect count data. Here, the cases related to peat extraction projects in 1996–2018 are presented together with the results of bird surveys repeated to five peat extraction sites in Eastern and Northern Finland in 2018.

Our results provide more information and means to EIA authorities to more accurately assess forthcoming projects and their environmental impacts, and to improve the mitigation of harmful effects in advance. It is also possible to denote species susceptible to particular environmental changes, which helps the planning of ecological compensation to mitigate the occurred biodiversity losses during the construction work.

SPATIAL PATTERNS IN HABITAT SPECIALIZATION OF EUROPEAN BIRD COMMUNITIES

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The level of habitat specialization is informative in terms of animals' space use and life-history evolution. In the context of global change, we are witnessing how specialists are slowly declining. Under this scenario, identifying the areas where specialist species are aggregated and understanding the ecological constrains that might shape their distribution has become an important issue, not only for their conservation but also to understand the ecological implications of specialization. In this sense, we test whether specialist communities are more likely to succeed in milder and stable environments or in harsh less predictable environments. For that purpose, we used data from the EBCC atlas of European breeding birds and for each of 50x50 km grid cells calculated several the community specialization index (CSI). We expressed CSI in three ways to cover different facets of specialization patterns: mean community specialization index (CSIMEAN), median community specialization index (CSIMEDIAN) and the standard deviation of the community specialization index (CSISD). We used generalized least squares models to relate these measures to geographic variables (latitude, longitude and altitude) and climatic variables (temperature and rainfall) across Europe.

We identified two areas, Scandinavian Peninsula and the southernmost lowlands of Russia, where bird communities are highly specialised. Moreover, high level of specialization was in montane regions of Europe. This spatial pattern was broadly shared by the CSIMEAN and CSISD. Concerning climatic variables, we found that specialist spatial distribution was significantly affected by extreme temperatures and lower level of precipitation. Our results thus suggest that European specialist birds tend to be successful in harsh environments. Thereby, preserve these sensible environments from further perturbations might be the key for the specialist conservation. Furthermore, the presence of one "hotspot" of specialization in the Russian lowlands serve as example of how important might be inclusion of such understudied Eastern Europe regions into continent-level analyses.

USING BIRD MONITORING DATA TO TEST COMPETITION-DRIVEN NICHE DIVERGENCE

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Many species show a mosaic distribution within sympatric zones, with the syntopic sites occupied by both species, and allotopic sites where only one species occurs. It is unclear whether such mosaics arise as a consequence of competition-driven niche segregation or due to the decline of their abundances towards range edges driven by environmental gradients. To test this, we used data collected within the Common Breeding Bird Survey in Poland, which runs since 2000 and involves engagement of several hundreds of highly qualified volunteer ornithologists. We used data on the abundance of two closely related bird species: the Common Nightingale *Luscinia megarhynchos* and the Thrush Nightingale *Luscinia luscinia* collected across their range involving both allopatry and sympatry. We tested several predictions within a generalized mixed-effects modelling framework.

We found that interspecific competition gave marked imprints on patterns in habitat preferences of these two species. Whereas they preferred the same habitats in allopatry, their preferences became strikingly different in allotopy within sympatry where the abundance of the Common Nightingale increased towards dry and warm sites with low coverage of pastures, while the abundance of the Thrush Nightingale showed exactly opposite trends. It seems that both species "escape" from competition to allotopic sites covered by habitats avoided by the competitor. Our findings show how biotic interactions may shape macroecological patterns. Moreover, they question the widely accepted view on the habitat preference as a species-specific trait invariant across its entire geographic range. We argue that species distribution models should incorporate biotic interactions, otherwise the model outputs will not provide meaningful guidance for conservation practice. Finally, our study emphasizes the value of data coming from monitoring programmes and the importance of dialogue between researchers and citizens, what is fundamental to biodiversity conservation.

WATERFOWL POPULATION TRENDS ARE DRIVEN BY FOOD STRATEGY REGARDLESS OF CLIMATE CHANGE

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The growth in numbers of breeding populations of most of waterbird species in the Czech Republic and it spread to new breeding sites was related with increase in trophic level of fishponds since the end of 19th century. Nevertheless, the drop in population size was recorded since the early 1980's, when numbers of most of waterbird species started to decrease. The changes in numbers of breeding waterbids were analysed using data from May census on 272 fishponds in Czech Republic between 1981 and 2017.

Among 23 analysed waterbird species, the decreasing species considerably prevailed, when decrease in breeding population size was confirmed in 14 species, including nine species in category "strong decline" with decrease more than 5% per year. On the contrary, moderate increase was confirmed only in six species and strong increase was not found in any species. The above mentioned decrease is still continuing and recently (2015-2018) breeding population size reached about 15% of breeding population size recorded in the early 1980's this decrease was more pronounced in benthophagous species, such as Tufted Duck *Aythya fuligula*, Common Pochard *Aythya ferina*, Northern Shoveler *Spatula clypeata* or Common Teal *Anas crecca*, Black-necked Grebe *Podiceps nigricollis*. On the contrary, growth in breeding numbers of mostly herbivorous Red-crested Pochard *Netta rufina*, Greylag Goose *Anser anser* and Mute Swan *Cygnus olor* contrasted with these declines. Differences in trends of breeding population can be explained much more by feeding preferences than by trends in Pan-European population which seems to be more affected by global climate changes. The main drives of changes in breeding population size of duck species are both (1) decrease in reproduction success as well as (2) migration of duck females with low breeding success in previous breeding season. The main causes for low breeding successful is low availability of suitable invertebrate food for duckling due to direct completion between Carp stocked in fishpond in higher density.

IMPACTS OF MICROCLIMATE ON THE DISTRIBUTION OF BIRDS IN AN ALPINE ENVIRONMENT

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Species distribution models of mountain birds have usually used large-scale temperature estimates. However, the topographic complexity of mountain areas could create microclimatic refuges which may influence species distributions. In order to assess whether fine-scale data (temperature and/or topography) improve model performance when predicting species occurrence, we collected data on presence-absence of bird species, estimates of habitat cover, and fine-scale temperature measurements along an altitudinal gradient in the natural Park of Val Troncea (NW Italy). Data on topography and large scale temperature were extracted from online databases. We compared species models (fine-scale vs large-scale variables for temperature and topography) using an information-theoretic approach.

We found that models based on microclimatic data outperformed those using large-scale temperature data for grassland birds, but for ecotone species there was no difference. Contrary to previous findings, grassland birds were positively associated with warmer microclimates. These results suggest that microclimate plays an important role in the settlement decisions of grassland species and those previous predictions about impacts of rising temperatures on Alpine birds may have to be re-assessed.

SESSION 2B – METHODS: SURVEYS + POPULATION SIZES

AUTOMATING THE ANALYSIS OF TERRITORY MAPPING DATA IN BIRD MONITORING

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Bird populations have proven to be practical and meaningful indicators for tracking environmental changes. One of the key methods in monitoring bird populations is territory mapping. This work evaluated whether bird monitoring data collected with this method can be analysed automatically. The analysis of territory mapping data is not only time-consuming but also known to leave substantial scope for interpretation by human analysts. This subjectivity makes the analysis of territory mapping data susceptible to changes the way the data are interpreted across time and space. The call for automation is hence neither new nor surprising. But previous attempts to automate the analysis either failed to develop algorithms that were generally applicable for many species, failed to use methods that were flexible and adaptive to local conditions and input data or were only applicable to extremely labour-intensive forms of territory mapping (those requiring 8-12 surveys per season). A novel approach was developed that estimates between-territory distances based on information in the recorded observation data. These site-year and species-specific distances are used to terminate a hierarchical clustering algorithm the right moment.

Application on a large data set of the common breeding bird monitoring in Switzerland revealed that automatic analysis returns similar territory counts as manual solutions. Specifically automatic analysis was rather precise deviating from manual territory delimitation by only 12% on average. Globally the number of territories was overestimated by 2%. Comparison with accuracy of manual territory delimitation revealed that these deviations are of similar magnitude indicating that automation of analysis for many species is possible. Further optimisation of parameters is however recommended. Removal of subjectivity in the analysis of territory mapping by automation will reduce risks for biases in the data dramatically and is putting the analysis of already highly valued long term monitoring data on even more sound grounds.

MONITORING OF WINTERING DUCK POPULATIONS IN KRASNODAR PROVINCE, RUSSIA

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Being important hunting resources with estimated annual bag of 1.2 million individuals in European part of country, ducks are among priorities of wildlife monitoring in Russia. International Waterbird Census (IWC) is the main scheme to monitor ducks and other waterbirds at their wintering grounds in southwestern parts of the country with support of federal and regional authorities. Krasnodar Province encompasses coasts of Sea of Azov and Black Sea, numerous lakes, water reservoirs and ponds which, in combination with arable lands, provide good conditions for wintering ducks, especially in mild seasons. Between 2003 and 2018 the IWC has been conducted annually in the region except for 2007-2009. The coverage varied, depending mostly on the available funds and freezing conditions of wetlands. Altogether, 39 wetland sites were counted at least once with high coverage (27 sites) in 2004.

The total numbers of waterbirds varied from 145,614 in 2003 to 1,112,213 in 2013. Ducks were always abundant and made up between 42% and 84% from total waterbird numbers counted in different winters. Altogether, 20 species of shel, dabbling and diving ducks were found. Mallard *Anas platyrhynchos* (highest total was 677,104 in 2018), Tufted Duck *Aythya fuligula* (137,839 in 2014) and Common Pochard *Aythya ferina* (106,069 in 2013) were the most numerous species and showed strong or moderate increase over the reported period. Among individual sites, Varnava and Kryukovo water reservoirs, Taman Bay and Kiziltash limans supported the largest congregations of wintering ducks. Globally threatened species included Common Pochard (VU), Long-tailed Duck *Clangula hyemalis* (VU) and White-headed Duck *Oxyura leucocephala* (EN). Distribution, population trends and influences of natural and man-made factors are further discussed.

INTRODUCING UPLAND ROVERS TO THE BREEDING BIRD SURVEY AND INVESTIGATING POTENTIAL IMPACTS

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The UK BTO/JNCC/RSPB Breeding Bird Survey (BBS) has been running since 1994. Throughout the survey period, there have been concerns with regards to differences in coverage, with some remoter areas of the UK receiving lower annual coverage than the lowlands and areas with higher human populations. Although the data are analysed in a way which accounts for spatial heterogeneity in sampling effort, weighting the data received by region accordingly and ensuring all squares covered are selected using a random stratified sample, investigations suggested the situation could be improved. Several initiatives have been introduced to the BBS, from targeted training and survey mentoring to changes in survey methods, such as 'Upland Adjacent Squares' and more recently 'Upland Rovers'. The latter allows one survey visit (rather than the standard two visits) to a square during the survey period of April to June, for a carefully selected suite of more remote BBS squares. It was identified that allowing one visit may alter population trends produced by the BBS and that the timing of the single visit may also impact on the standard of data collected, i.e. before some species have arrived back to the UK from their wintering grounds or visiting at times when levels of detectability influences the counts. We investigated single visits and visit timing within the existing BBS database with the aim of identifying potential impacts of introducing the 'Upland Rovers' single visit initiative and increasing the number of single visits and any current changes in visit timings. We also studied the impacts of any existing 'drift' in visit timings and identified if there is an optimal time for single visits and how consistent that timing is. This presentation will cover the reasons behind Upland Rovers and whether this could impact the current dataset going forwards.

LESSONS LEARNED BY COMPARING RESULTS FROM NATION-WIDE WATERBIRD MONITORING TO RESULTS FROM A REDUCED SITE NETWORK, AKA "WHEN COUNTING BIRDS ONLY COUNTS IF YOU COUNT THEM ALL!"

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Improved computer capacities, internet connectivity, and online databases make accessing avian count data increasingly easier than was possible in the past. Increasing demands from many major scientific journals to deposit raw data also renders yet more data online. In parallel with these developments, more scientists are embarking upon data-mining research, where they formulate a hypothesis, download data, run analyses and write a paper without being involved in data collection. As a result, analyses may lack appropriate insights into the possibilities offered by the data, but also the limitations imposed by the nature of the data, features of which the data collectors will be aware. In 1987, Denmark started systematic monitoring of waterbirds from a so-called reduced site network (RSN) to contribute systematically to the annual midwinter International Waterbird Census (IWC). Hence, 48 sites considered by expert judgement to be representative of typical near-coastal waterbird communities throughout the country were selected to be counted annually, enabling estimation of annual indices for these waterbird populations, both nationally and internationally. In addition to the RSN's, complete national censuses of all waterbirds were conducted in 10 separate years between 1987 and 2016.

In this presentation, we illustrate that there was a strong relationship between the results from the RSN and the national census totals for several species (*e.g.* Mute Swan *Cygnus olor*, Mallard *Anas platyrhynchos*, Pochard *Aythya ferina* and Common Coot *Fulica atra*). However, for some species, the RSN national trend underestimated true trends, because an increasing proportion of the national population was found outside of the RSN sites, as in the case of the Whooper Swan *Cygnus cygnus*. For yet other species, such as Red-breasted Merganser *Mergus serrator* and Smew *Mergus albellus*, there was very poor correspondence between the two sets of monitoring results. These patterns challenge the "representativeness" of the selected sites to provide appropriate data across all species and caution against the indiscriminate use of accessible data without an understanding of their shortcomings.

DEALING WITH PREFERENTIAL SAMPLING IN BIODIVERSITY MONITORING

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Preferential sampling (PS) is an important example of non-random sampling, where (usually) 'better' sites have a higher probability to be selected, i.e., visited, or surveyed. Arguably, PS always occurs in biodiversity monitoring unless a scheme has a prescribed set of sampling sites and predefined visits chosen according to some known probability design. However, virtually no citizen-science scheme in the world has such a design. Disconcertingly, unless its effects are corrected for, PS will lead to overestimation of distribution or abundance if the sampled sites are extrapolated, implicitly or explicitly, to a wider region. Moreover, spurious trends can arise if the magnitude of PS changes over time. We will demonstrate PS in two illustrative examples: a long-term population study of peregrine falcons in the French Jura Mountains (1964–2016) and an opportunistic survey of breeding bird records in Switzerland. In both cases, we will show how PS can be diagnosed and then corrected for using a joint model for the bird abundance/distribution and the visitation scheme of the surveyed sites.

COUNTS OF AVIAN COMMUNAL ROOSTS TO ASSESS LOCAL POPULATION SIZE

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Communal roosting is a common behavioral trait of many bird species. In spite of this, it is an underrepresented aspect in the study of avian ecology and it has the potential to be a tremendous tool for population size assessment. In the Netherlands, communal roost counts have been systematically undertaken during the last 10 years for estimating local population sizes of 19 bird species of concern to the Natura 2000 network.

We present, for the first time, nationwide trends based on these counts. We discuss our methodology and the strengths and pitfalls of communal roost counts compared to breeding and water bird surveys. We find that communal roost counts are useful especially in species that scatter widely across the landscape to forage during the day, and in species that are difficult to detect while foraging because of their inconspicuous behaviour or because of inaccessibility of their habitat. Finally, the location and size determination of roosts is important in taking local conservation decisions and are of vital importance to the protection of roosts under the Birds Directive.

PRODUCING WINTER WATERBIRD ESTIMATES FOR GREAT BRITAIN

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Information on national winter population estimates for waterbirds provide critical context for conservation decision-making. Quantitative information on relative international distributions is becoming increasingly valuable for flyway assessments of population size and trends. This talk will outline the diverse approaches and latest methods for estimates for 98 waterbird species/populations in Great Britain.

Many species are well monitored through the United Kingdom's Wetland Bird Survey (WeBS), which obtains good coverage of estuaries and large wetlands, and some coverage of smaller wetlands such as ponds and rivers. For species where coverage by WeBS counts approaches a full census, the estimate is formed by a five-year average of WeBS counts, after imputing missing counts. For species which occur in significant numbers outside WeBS sites, the estimate is obtained by multiplying this figure with an extrapolation factor derived from intensive local studies. For very widely dispersed species, an approach combining WeBS data with a detailed environmental stratification and a geographic mask from national Bird Atlas data is used to estimate winter populations. Species that occur outside of estuaries on the coast are not completely monitored within the Wetland Bird Survey, which only covers a small fraction of the non-estuarine coast. The periodic Non-estuarine Waterbird Survey fills this monitoring gap. The latest survey (in January 2016) surveyed 8,751 km of 16,604 km of coast. A bootstrap approach was used to estimate the non-estuarine component of the population, and this was combined as appropriate with estuarine and inland estimates for relevant species. Estimates for remaining species were based on literature, expert opinion, aerial surveys at sea, ad-hoc bird records and the Winter Gull Roost Survey.

THE ESTIMATION OF SWISS BREEDING BIRD POPULATIONS REVEALS MAJOR CHANGES OVER 20 YEARS

Thomas Sattler, Nicolas Strebel, Sylvain Antoniazza, Jérôme Guélat, Marc Kéry, Claudia Müller, Andy Royle, Jérémy Savioz, Hans Schmid, Samuel Wechsler, Peter Knaus

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The estimation of bird population sizes poses major challenges for any country. Extensive field work for the Swiss Breeding Bird Atlases 2013–2016 and 1993–1996 and modern statistical analyses, *e.g.* correcting for detection probability enable us to estimate current population sizes and population changes over 20 years with comparatively high precision. We applied four different approaches: 1) complete counts; 2) extrapolation of territories mapped in app. 5% of Switzerland (total area 41,285 km^2); 3) extrapolation based on occupancy probability multiplied by known densities; 4) extrapolation from regional counts to the national level.

The total number of Swiss breeding birds is around 10 Million territories with the Common Chaffinch *Fringilla coelebs* as the most abundant species (900,000–1,100,000 territories). Over the 20 years, we found an overall increase in the number of territories of about one Million driven by the positive population trends of several abundant forest species like the Blackcap *Sylvia atricapilla*, Northern Wren *Troglodytes troglodytes* and Common Chaffinch. Relative population changes were dominated by medium- to large-sized colony-breeders, e.g. European Bee-eater *Merops apiaster* (increase by factor 12), Rook *Corvus frugilegus* (factor 8) and Yellow-legged Gull *Larus michahellis* (factor 7). Insectivorous specialists and long-distance migrants are in (sometimes steep) decline, especially in the agricultural area. The population of the Red-backed Shrike *Lanius collurio* has halved to 10,000–15,000 territories, the Eurasian Skylark *Alauda arvensis* lost approx. 45% to the current 25,000–30,000 territories. These processes lead to a homogenisation of the species composition. The increase of avian biomass is even stronger than the increase in territory numbers. The gain in avian biomass over the last 20 years was about 20% driven by the strong increase of the Wood Pigeon *Columba palumbus*. Our results highlight major, sometimes even dramatic changes in the Swiss avifauna over the relatively short study period of 20 years.

SESSION 3A – POPULATION DYNAMICS

IMPACT OF USUTU VIRUS (USUV) ON BIRDS IN BELGIUM

Marc Herremans, Kristijn Swinnen, Julie Tytgat, Gerald Driessens, Glenn Vermeersch, Antoine Derouaux, Jean-Yves Paquet, Anne Weiserbs, Daniel Desmecht, Mutien Garigliany, Emna Benzarti, Annick Linden and Didier Vangeluwe

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Usutu virus (USUV) was first confirmed in Belgium in 2012 (diagnosed in two corpses). A first widespread outbreak affected 6.000 km² in NE Flanders in late summer 2016. It was followed by a much larger outbreak (12.000 km²) in summer 2017, and again in summer 2018, expanding further West (15.000 km²). Many sick and dead Blackbirds *Turdus merula* were reported by the public to the dataportal www.waarnemingen.be / www.observations.be. Analyses of 131 birds of 40 species found dead over a wide area of southern Belgium in 2017-2018 showed 37 birds of 11 species to be positive for Usuv. We evaluated the impact of Usutu outbreaks at population level in common birds, contrasting changes from zones outside/before with inside/since the outbreaks. We used data from Common Bird Monitoring (CBM), ringing and random tracks to screen for species most affected.

Bird abundance recorded in CBM tends to be surprisingly noisy and these annual fluctuations complicate interpretation of sudden changes that could be related to Usuv mortality. In Flanders, of 60 species, Tree Sparrow *Passer montanus* (-85%/+38%), Moorhen *Gallinula chloropus* (-60%/+57%), Songthrush *Turdus philomelos* (-19%/+16%), Blackbird *T. merula* (-11%/+24%), Wren *Troglodytes troglodytes* (-13%/+22%) and Dunnock *Prunella modularis* (-13%/+28%) fitted the expected contrasting patterns for each area exactly. Overall, in 31 of the 60 species annual changes were >20% worse inside than outside affected areas (11 species even >50% worse). Only 17 did >20% better inside.

Declines were habitat specific: more marked in areas dominated by (sub)urban, agriculture or wetlands, but no declines in woodland. This pattern fits the ecology of Usuv: thermophilic, faster mosquito (vector) cycles in small water bodies on artificial substrates, and density dependent risks of outbreaks. In the less urbanized, more wooded and hilly parts of Wallonia, declines fitting Usuv were less obvious, despite the virus having been demonstrated to be widespread.

LONG-TERM TRENDS IN SEASONAL SURVIVAL IN A SWISS POPULATION OF ALPINE SWIFTS

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Populationsof migratory birds face declines, but understanding of the processes involved is hampered by the fact that they move between (often widely separated) locations through the year. Assessing the drivers of survival is particularly difficult as captures are required at multiple times of year. Because of this there are very few independent estimates of breeding and non-breeding survival in the same population of individuals.

Here we will present results from a long-term (1993-2018) study of an Alpine Swift *Tachymarptis melba* in Baden, Switzerland, where individuals are caught at the beginning and end of the breeding season, and compare the extent of variation (and correlation between) breeding and non-breeding survival. We will set this variation in the context of a truly long-term (1920-2018) study of Alpine Swifts in another Swiss colony for which annual survival rates can be estimated.

DECLINE OF THE LONG DISTANCE MIGRANT SAND MARTIN IN HUNGARY - THE ROLE OF MIGRATION AND BREEDING

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Since 1990, our research group has continuously monitored a large breeding Sand Martin *Riparia riparia* population along the near 600 km long Tisza River in eastern Hungary. Our long-term studies demonstrate a strong decline over the last near 30 years: the population in 2018 was less than 10% of its surveyed size in 1990, based on annual census (i.e., from ca. 30,000 to ca. 3,000 pairs). Modelling survival of breeding adults, based on regular and intense ringing (149,000 individuals) at breeding colonies along the 40 km long upper section of the river since 1986, show that adult survival rates varies among years and drought condition in the Sahel could cause large annual decrease. However, there is no significant declining trend in the survival rate of adults over the last 30 years, which alone could explain the found decline.

The breeding success (measured by the number of fledged nestlings) varies over the years, but there is no obvious declining trend over the last near 25 years, based on weekly endoscope survey of 16,000 nests since 1995 at randomly selected sections of colonies. Our detailed study on a large population show, that recruitment, based mainly on condition and survival of the fledged nestlings and condition of breeding habitat could play crucial role in the marked decline. The direct and indirect influences of climate and habitat changes in the breeding, migration and wintering areas act both seasonally and both trans-seasonally need to consider for identifying factors behind the decline. We acknowledge funding from the National Research, Development and Innovation Fund of Hungary (NKFI/OTKA K 120348) grant.

SESSION 3B – ACOUSTICS

ANIMAL SOUND IDENTIFIER (ASI): SOFTWARE FOR AUTOMATED IDENTIFICATION OF VOCAL ANIMALS

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Acquiring adequately replicated large-scale and long-term data remains a major challenge in ecological research and biodiversity monitoring, especially for species-rich taxa in remote areas as well as taxa that require expert input for identification. For vocal taxa such as birds, automated audio recording offers a powerful tool for acoustic monitoring schemes, capable of capturing information about vocal animals at adequate ecological scales. Technical developments have enabled a significant increase in the amount and accuracy of data, but simultaneously they pose new challenges in the processing, analysis and interpretation of the data. While several methods have been proposed to analyze and automatically identify species from continuous field audio recordings, reliable automated identification algorithms capable to operate in large scale and that would reach even close to the same level of species identification as obtained by manual identification by experts are still lacking. In this work I present Animal Sound Identifier (ASI), a method to probabilistically classify animal sounds from audio data collected directly from the field. ASI is developed as a ready-to-use software for utilizing autonomous field recordings to acquire community-level data on the occurrences and abundances of vocal bird species.

I will present case studies of tropical bird communities from Amazon and from Finland to illustrate that the ASI framework is able to perform reliable species classification for different vocal communities, based on automatically localized training vocalizations and minimized user effort for training the classification models. I demonstrate the software and its six-step procedure, which results in a probabilistic classification of the presences or absences of the vocalizations of the target species across thousands of hours of recordings.

ACOUSTIC ADAPTATIONS OF CITY BLACKBIRDS: A BIOINDICATOR FOR URBAN PARKS IN ROMANIA

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Habitat fragmentation and rapid urbanization set urban parks forth as essential connectivity sites on songbird migration routes. This exposes low-frequency migrants to vocal communication anthropogenic interference and reduced signal efficacy, adding to migrational stress. Our one year study (2017/2018) addresses song adaptations of a territorial, urban bird relative to environmental noise and aims to correlate the results with songbird migratory abundance and diversity in 4 large urban parks, in Bucharest (positioned on the fifth bird migratory pathway over Romania – the Central-European-Bulgarian route). Recorded dusk songs of male Eurasian Blackbirds *Turdus merula* were analyzed for syllable duration and peak low frequencies, and compared to levels of anthropogenic noise. Migratory songbird data was collected through point counting and transect monitoring.

Male Blackbirds tended to shift song frequencies higher in response to urban noise, and vocal transmission in louder areas also featured longer motif syllables. Furthermore, artificial night lightening caused city males to extend dusk singing by 1 hour. Additionally, species diversity and abundance for low-frequency migrants correlated positively with reduced values of the low frequency peak for Blackbird dusk singing. Consequently, gaining quick insight on habitat suitability for migratory songbirds by use of acoustic adaptations in male city Blackbirds may hold broader implications for adequate planning of urban parks and designing ex-situ conservation areas on migratory routes in human-altered environments. We postulate that further research could relate song adaptations to population trends in urban Blackbirds to reveal a potential low frequency peak threshold which may equate a decline in Blackbird numbers, thus consolidating this taxon's position as a reliable bioindicator of urban parks.

ESTIMATING BIRD DENSITY FROM SINGLE AUTOMATIC PASSIVE ACOUSTIC RECORDERS

Tiago A. Marques, Esther Sebastián-González, Richard J. Camp, Ann M. Tanimoto, Priscilla M. de Oliveira, Bruna B. Lima, Patrick J. Hart

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Density is a key state variable to estimate when effective management is required. Distance sampling is a widely used method for estimating animal density. Usually, distance sampling for birds involves human observers searching visually and/or aurally for species of interest from points along transects, and recording the detected distances so that a detection function can be estimated. From it, an estimate of density follows. Recent years have seen an increase in the use of passive acoustic methods for estimating density. Here we describe the use of distance sampling from single passive acoustic recorders. Instead of the usual distances, the signal strength of the detected bird songs or calls is converted to distances via a calibration exercise. We illustrate the methods using a survey to estimate the density of a Hawaiian forest bird (Hawai´i ´Amakihi *Chlorodrepanis virens*) on the island of Hawai´i, USA. We validated our approach by comparing the obtained density estimates to traditional point-transect distance sampling method, based on human observers.

Overall density estimates based on recorded signals were lower than those based on human observations, but 95% confidence intervals of the two density estimates overlapped. This study presents a relatively simple but effective protocol for estimating animal density using single automatic acoustic recorders. Our protocol may easily be adapted to other sound-emitting terrestrial animals. We conclude with some ideas for future work in this area.

SESSION 4A – ATLAS

THE PUBLISHING OF THE NEW ORNITHOLOGICAL ATLAS OF SLOVENIA: THE RESULTS AND LESSONS LEARNT

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In March 2019 the new ornithological atlas of Slovenia appeared. The atlas has been long overdue; the systematic surveys were carried out in the period from 2002 to 2012. For the rare breeders we added the data from 2013 to 2017. The atlas has detailed species account section with the main text, comparison chart, main chart, altitudinal distribution plot and numerical table. The main text includes the overview of species specific literature and short accounts on their status, breeding habitat, trends and main threats in Slovenia. The comparison chart compares the current distribution of the species with that of the previous atlas (published in 1995, with the data from 1979-1994). The main chart depicts breeding density for common species (and point distribution of rarer species); the method for the presentation is ordinary kriging.

Altogether 238 species accounts are included in the atlas, of which 227 are at least probable breeders. Beside the (sometimes dramatic) changes in the species distribution, the main outcome of the atlas was the advancement in the work with volunteers and data management. The atlas proved to be one of the drivers for the successful work with volunteers through common surveys, expeditions to survey rarer species and common work on species accounts in the book. The most important factor was a simple and volunteer-friendly field method which included not only mandatory transects but 25% of transects chosen by volunteers themselves. A direct offshoot of the atlas was the web database which was launched in 2012 and proved to be an extremely effective tool for data gathering and motivation for volunteers. In the conception phase of the atlas we were not aware of the advanced modeling tools (regression kriging) which would greatly facilitate the planning of the field work (reducing the field effort for the more common species). Instead we carried out a very detailed field survey which took longer than expected. We estimate that for the next atlas the data gathered through web database together with some target surveys, will suffice and that the production of such an atlas will take a much shorter time due to the use of advanced modelling techniques.

MAPPING BREEDING BIRD DISTRIBUTIONS IN AN ALPINE COUNTRY – METHODS, OBSTACLES AND PRELIMINARY RESULTS OF THE 2ND AUSTRIAN ATLAS

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The surveys for the 2nd Austrian breeding bird atlas took place from 2013 to 2018. This talk aims to report on the planning and realization of the atlas work, as well as to give insight into some preliminary results. Faced with the facts that (1) the Alps encompass about two thirds of Austria, (2) the number of observers is both limited and (3) unevenly distributed over the country, finding a suitable sampling method proved to be the first crucial point. Aside from qualitative mapping of all breeding bird species in 10x10 km squares, we decided to draw systematic subsamples in 20-25 squares measuring approximately 615x615 m. A specific module of the online data-recording platform www.ornitho.at was used for data input, data checks and to provide real-time preliminary maps, the latter acting as an important feedback tool for the observers. The survey effort was unevenly distributed, with less intensively sampled regions in both the Alps and in areas inhabited by few birdwatchers. Project funding from the Austrian government and cooperation with the regional government of the province of Tyrol was essential. Interaction with landowners proved to be tricky in some cases on a local level, as well as for the project as a whole. Nevertheless, we were able to collect approximately two million records of breeding birds. Some 2,000 observers took part in the atlas survey, and approximately three quarters of the grid cells designated for the systematic sampling were surveyed.

Compared with the first Austrian atlas (1981-1985) the fieldwork resulted in a more complete picture of qualitative distribution for most alpine bird species. Final data validation is yet to be done, but a first comparison with the 1980s atlas will be shown based on the preliminary data. Among others, substantial changes appear to have taken place e.g. in Grey partridge *Perdix perdix*, Lapwing *Vanellus vanellus*, Skylark *Alauda arvensis* and Whinchat *Saxicola rubetra* (range contractions), as well as in Goosander *Mergus merganser*, Black Stork *Ciconia nigra*, Pygmy Cormorant *Microcarbo pygmaeus* and Eastern Imperial Eagle *Aquila heliaca* (range expansions and (re-)colonisation).

THE NEW DUTCH BIRD ATLAS AND BEYOND

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In November 2018, the fourth national bird atlas of the Netherlands was published, this time covering both breeding and wintering species. The atlas presents the distribution and abundance of 369 bird species occurring in the Netherlands in 2013-15, bringing together the efforts of over 2,000 volunteer field workers. Also, the atlas summarizes 40 years of change in Dutch bird populations, including information from our national monitoring schemes. We will highlight a selection of the most interesting findings of the atlas. This includes examples at both the species and community level, such as multi-species hotspot maps, change maps and ongoing biotic homogenization. We will discuss forthcoming applications of atlas data for policy and conservation, and for the update of the stratification and weighting procedure used in the calculation of abundance trends from the monitoring schemes. Finally, we will present our ideas on how to keep track of within-year and between-year changes in occurrence in the future: LiveAtlas. In this new project we will combine existing monitoring data with low threshold species listing.

THE SWISS BREEDING BIRD ATLAS 2013–2016

Peter Knaus, Sylvain Antoniazza, Samuel Wechsler, Jérôme Guélat, Marc Kéry, Nicolas Strebel, Thomas Sattler

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The distribution of Swiss breeding birds has been documented in a rhythm of 20 years since 1950–1959. This allowed illustrating long-term changes. Further, territory mapping in more than 2,300 squares of 1x1 km (5% of the national territory) both in 1993–1996 and 2013–2016 allowed modelling population density or occupancy and their changes on a fine spatial resolution. For these density and occupancy maps we considered 16 environmental covariates as well as detectability and spatial autocorrelation. Over the last 60 years, several birds of prey have made a long-term recovery. These popular, iconic birds are well protected by law. In contrast, farmland birds have suffered the greatest losses. While the lowlands are most affected, pressure is now increasing in the mountains as well.

In the last 20 years, many long-distance migrants have lost ground. Insectivores in particular are in steady decline. Their index declined from 100% in 1990 to just 40% in 2016. The new Swiss breeding bird atlas is for the first time synthesising findings across multiple species in 46 specific chapters in order to give an overview about important trends and drivers of change in Swiss bird populations.

THE THIRD DANISH BIRD ATLAS - CHANGES IN SPECIES DISTRIBUTION, DENSITIES AND ABUNDANCE

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The aim and scope of the third Danish bird atlas is to estimate species distribution, density and abundance of common breeding and wintering birds, and assess population estimates for approximately 45 breeding and 30 wintering species. Furthermore, for 18 less common species, to obtain improved population counts. Through the years 2014-2018, 398,385 observations on altogether 217 species were collected by 1,468 volunteers, in 2,244 5x5 km atlas grid cells, covering approximately 99% of the country. Moreover, to obtain population estimates for the most common species 4,929 distance sampled transects were carried out, distributed over the early-breeding, late-breeding and winter season. The three Danish bird atlases have been carried out 20 years apart, and in this time-span changes in land-use and climate, have impacted on the presence and distribution of species and populations. Here we present the main findings and conclusions from the third Danish bird atlas, focusing on changes in species distribution, densities and abundance. Finally, we will touch upon methodological challenges, and discuss implications for species conservation, and informed decision making.

SESSION 4B – MIGRATION

INTEGRATING LARGE-SCALE CITIZEN SCIENCE DATA TO REVEAL THE DRIVERS OF POPULATION CHANGE IN LONG-DISTANCE MIGRATORY BIRDS

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In Europe, breeding bird abundance is monitored through a citizen science network coordinated by the Pan-European Common Bird Monitoring Scheme (PECBMS), while demographic surveys are carried out through the Euro-CES (Constant Effort Sites) scheme. Across these networks, severe declines in many Afro-Palaearctic migratory bird populations, particularly those travelling to the humid tropics of Africa, has focused attention on identifying threats operating during the non-breeding season. However, substantial within-species variation in population trends across breeding ranges suggests that breeding ground processes could also be involved. Identifying the demographic drivers of population declines is a critical step in designing appropriate and effective conservation management. Using PECBMS and Euro-CES data from 17 countries, covering more than 14,000 sites and 80 species over the last three decades, we show that, on breeding sites across Europe, co-occurring species that either migrate to Africa or stay within Europe have (1) similar direction and magnitude of population trends and (2) similar levels of productivity but not survival rates. This strongly suggests that the influence of local breeding season conditions on productivity is a major driver of current population trends. Using integrated population models for one common migrant species, we also demonstrate the potential for improved productivity, but not survival, to drive population recovery. Our analyses highlight the potential for targeted improvement of breeding season conditions to influence productivity and population trends of these migratory species, and the hugely important role of citizen science monitoring of bird abundance and productivity in uncovering the demographic drivers of population change.

LONG-TERM MONITORING OF SOARING BIRDS MIGRATION IN SOUTHWEST PORTUGAL

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In Portugal, the highest concentrations of migrating soaring birds (MSB) are observed in the Sagres region (SW Portugal) during the autumn. This area works as a dead-end for the majority of the birds, which are mostly juveniles/immatures that will ultimately cross between continents in the Strait of Gibraltar. This work intended to characterize MSB migratory patterns in the Sagres region and evaluate the area's overall importance in the context of the Western European migratory corridor. MSB monitoring started in 2004 and was made on a daily basis since 2009. The monitoring period covered the whole autumn period, extending from mid-August to the end of November. A total of 35 species was recorded, with total annual estimates varying between 2,500 and 5,500 birds. The most representative species were Griffon Vulture *Gyps fulvus*, Booted Eagle *Hieraaetus pennatus*, Black Kite *Milvus migrans*, Short-toed Snake-eagle *Circaetus gallicus*, Eurasian Buzzard *Buteo buteo*, Eurasian Sparrowhawk *Accipiter nisus* and European Honey-buzzard *Pernis apivorus*, accounting for 88% of the total migratory flow. Criteria for international importance (>1% of the European population) were met for six species.

Four globally threatened and one near threatened species were recorded, demonstrating the region's importance for species of conservation concern. New species have been increasingly recorded as regular visitors over the last decade, such as the Rüppell's Vulture *Gyps rueppelli* and the Lesser Spotted Eagle *Clanga pomarina*. Migration phenology varied markedly including early (*e.g.* Montagu's Harrier *Circus pygargus* and Black Kite) and late migrants (e.g. Cinereous Vulture *Aegypius monachus* and Red Kite *Milvus milvus*). Migratory flow trends presented are based on a 15-year monitoring period and vary among species: e.g. Montagu's Harrier and Egyptian Vulture *Neophron percnopterus* show a negative trend, while *e.g.* Osprey *Pandion haliaetus* and Western Marsh-harrier *Circus aeroginosus* show a positive trend. The importance of the Sagres region is revealed by the proportion of the migratory populations relatively to the Portuguese and European breeding populations, and by comparing the results with other bottlenecks for MSB in the Western Palearctic.

CHANGES IN WINTERING AREAS: LONG-DISTANCE MIGRANTS AND MIGRATORY CONNECTIVITY WILLOW WARBLERS ON THE WINTERING GROUNDS IN WEST AFRICA

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Monitoring on the European breeding grounds shows that long-distance migrants are declining overall. However, little is known about the underlying causes and whether changes in climate or habitat conversion on the winter grounds are involved. Importantly, the links between breeding and wintering populations are poorly described and long-term monitoring of wintering migrants almost non-existent. Here, we report results on Willow Warblers *Phylloscopus trochilus* from regular ringing operations, transect counts and radio tracking in the Sudan Savanna Zone in Ghana and link these results to geolocator tracking. Both capture and geolocator data show that Willow Warblers are itinerant during winter in West Africa. Furthermore, numbers fluctuate widely among years with Willow Warblers being most numerous in taller Acacia trees in disturbed habitat. Understanding the spatio-temporal dynamics of Afro-Palearctic migrants is crucial for devising monitoring schemes and conservation action.

THE EURASIAN AFRICAN MIGRATION ATLAS – A NEW SYNTHESIS OF RINGING AND TRACKING DATA

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A high proportion of bird populations are migratory so understanding the seasonal movements of populations and individuals is vital for interpreting changes in distributions and abundances, and for understanding the impacts of environmental change. We describe an exciting new project that will combine over 4 million ring recoveries held by EURING with tracking data from Movebank and other sources to provide an up-to-date synthesis of the movements of bird populations that spend part of the year in Europe. The Eurasian African Bird Migration Atlas is the first component of the Convention on Migratory Species (CMS) Global Animal Migration Atlas and is being developed and compiled by EURING. The project started in autumn 2018 and is due to be completed in 2021. Accounts of the movements of some 300 focal species will be supported by carefully selected maps while interactive web tools will allow users to explore many aspects of the data, and even to view data gathered after the project is completed. We will also work with EuroBirdPortal to explore links between seasonal occurrence patterns and the movements of specific populations. In addition to documenting the movements and migrations of different populations, the Atlas will address four applied research areas.

An analysis of the current migration seasons of hunted species will focus on measuring the start and end dates of return migration. An analysis of killing of birds by man, with particular reference to illegal killing, will use data on causes of recovery to assess which species are most affected, together with the regions and time periods where most killing takes place. Connectivity analyses will be undertaken to inform the conservation of long-distance migrants. Finally we will assess the extent to which long-term ring recovery data show major changes in migration routes and migratory behaviour.

THE FRENCH NATIONAL ATLAS OF MIGRATORY BIRDS: A MULTI-SCALE APPROACH TO APPREHEND THE MIGRATION OF BIRDS IN FRANCE

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Recent advancements in tracking technology and data acquisition have contributed to generating novel insights on bird migration. Capitalize on that, the French national atlas project of bird migration applies an innovative multi-scale approach combining information from different monitoring schemes. Since the most dedicated ringing program, to more recent citizen science dataset and tracking devices, these surveys together provide an unprecedented picture of a bird species migration, encompassing a multi-scale view, from flyway to French regions and from population to individual levels. In this talk, we present all datasets and methods used to describe the migration patterns of 320 species migrating to or through France: from regional and national bird banding, tracking programs, daily migration counts, radar surveys and citizen science datasets.

Bird movements were mapped at the continental scale in order to show the origins and destinations of different migrants. We provide further details on the power of big data analysis used from opportunistic datasets to access global migration phenology with spatial and temporal mapping from different French regions. From long-term migration counts on bottlenecks, we were also able to investigate effect of climate change on bird migration strategies as well as compute supra-regional demographic trends for some target species like soaring birds and passerines. The project, built on decades of migration study, was a great opportunity to highlight the contribution of scientist, naturalist and birder networks to the knowledge of bird migration. Furthermore, the lack of knowledge for many species about the migration routes and wintering grounds noted in this atlas was useful to target the future investigation on bird migration.

SESSION 5A – ATLAS (EBBA2)

ATLAS OF BREEDING BIRDS OF EUROPEAN PART OF RUSSIA: FIRST PRELIMINARY RESULTS

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Russian atlas is a part of EBCC European atlas project. It is a first real attempt to cover (almost) the entire territory of European part of Russia (c. 1,850 squares 50x50 km). Now, in the time between the end of the field work and publication of the final data in Russian volume as well as in EBCC European bird atlas planning at 2020, we can estimate the very first scientific and practical results of this huge affair. More than 1,550 squares were covered by surveys, so we will have a rather full impression of real modern distribution of more than 400 bird species on Russian territory. It will be a good addition to the whole European picture and also a first so detailed picture for birds of European part of Russia. Scientific results of bird atlases are well-known, they help us to understand habitat and landscape preferences of birds, to estimate dynamic of their ranges, provide data for biogeographical analysis and are urgently necessary for planning of bird protection projects. It was also important to examine the possibility of wide cooperation between ornithologists and volunteers from abundant regions of European part of Russia, the possibility of establishing of a really functioning ornithologist network and of forming a basis for future projects of European or even entire Russia, first of all bird monitoring projects. This experience in atlas work and in other activities connected with this project gave us a lot of material for discussion about place and role of volunteers in different scientific projects as well as ideas about ways of cooperation between ornithologists and volunteers in different regions of Russia.

QUANTIFYING CHANGE IN SPECIES DISTRIBUTION BETWEEN THE TWO EUROPEAN BREEDING BIRD ATLASES. APPROACH AND FIRST RESULTS

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Thirty years after the completion of the fieldwork for first European Breeding Bird Atlas (EBBA1), the new European Breeding Bird Atlas (EBBA2) represents a unique opportunity to determine changes in the distribution of bird species across Europe. Quantifying to what extent species ranges have changed between the two atlas periods is not a straightforward task. The major difficulty to robustly determine the change in distribution derives from the uneven intensities of coverage in the two fieldwork periods. Large areas mainly in Eastern Europe were not covered at all for EBBA1, and in regions covered in both atlases fieldwork effort was much bigger for EBBA2. Unfortunately, the survey effort at square level is very difficult to estimate due to the amount of non-standardised work used to record the species. Despite this complex context, EBBA2 will not only show maps with observed distributions in the two atlas periods but also intends to quantify the change. A combination of statistical analyses and expert assessments have been implemented to identify those squares where the intensity of fieldwork carried out in the two periods can be considered appropriate for the comparison.

In this presentation, we propose a procedure to quantify changes in the breeding distribution of species and some first examples, together with preliminary hypotheses of the environmental pressures that may have driven them.

EUROPEAN BREEDING BIRD ATLAS 2: THE FINAL RESULTS EMERGE

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Thanks to the immense effort of national coordinators and data providers the fieldwork period of the European Breeding Bird Atlas EBBA2 has been successfully brought to an end and all data have been delivered to the European coordination team in 2018. While the data checks are running and specialists are preparing texts for the species accounts, the final patterns are emerging. The database for information at the 50x50 km resolution contains around 570,000 records for 603 species. More than 35,000 species lists from standardised surveys form the basis to model probability of occurrence at a resolution of 10x10 km.

Spatial coverage of Europe and data quality have both increased massively compared to the first atlas. Distribution maps can now be shown for the whole eastern part of the continent up to the Ural Mountains and the Caucasus, including Turkey, thus greatly improving the knowledge for species with a more eastern distribution. Abundance estimates per 50x50 km square, which were lacking in EBBA1 for many regions, have been greatly improved. The modelled maps show patterns across Europe which can be linked to environmental parameters. The first multi-species analyses reveal patterns that will form the basis for further analyses in relation to environmental pressures. The talk will present examples of the different final atlas outputs, from maps for individual species to the first multi-species maps.

EUROPEAN BREEDING BIRD ATLAS 2 IN UKRAINE

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The territory of Ukraine includes 280 squares 50x50 km, all of them were surveyed. In general 100 ornithologists from Ukraine took part in EBBA2 work during 2013-2017. There were 2 main tasks before beginning of Atlas work: bird species lists with abundance estimation for each 50x50 km squares and 1-5 timed surveys accordingly. Active Atlas field work has begun in 2015 after international training by EBBA2 Steering Committee and due to MAVA financial support. It was found out that there were 276 breeding bird species in Ukraine, 3 of them were discovered in 2017 (Greater Flamingo *Phoenicopterus roseus*, Cattle Egret *bubulcus ibis*, and Red Kite *Milvus milvus*). 875 timed surveys were made with reliable data collected according to the methodology. The main problems were: occupied territories, abundance estimation, difference in bird Latin names, technical mistakes and unreliable data, methodology nuances, and gaps in rare species distribution. Most of them were solved by additional surveys, special rare species expeditions, and data checking. In 2018 the National Breeding Bird Atlas working group was created to prepare the publication of the book by the results of European Breeding Bird Atlas work. Breeding bird atlas of Ukraine will include two maps – breeding category and abundance map, and short text description of distribution in Europe and habitats in order to explain the species distribution of certain species in Ukraine in accordance to the maps. Fifteen experts were involved in checking the data and text writing. There will be also short description of methodology and complete list of executors (people engaged in fieldwork, additional data providers etc.) in the Introduction part.

MOLDOVA'S CONTRIBUTION WITHIN THE EBBA2

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The second European Atlas of Breeding Birds (EBBA2) is one of the most ambitious biodiversity mapping projects, aiming to update information on the distribution of breeding birds and to determine the changes occurred since the first atlas. The project relies on the participation of over 50 European countries, including Moldova, which faces with big ornithological challenges. Although the first atlas of the country was relatively recently published (2010), the lack of current and stable monitoring schemes (e.g. CBM, raptor or colonial birds monitoring schemes) combined with the environmental and climatic conditions which occurred over the last decade makes it almost impossible to accurately assess the current breeding status for many bird species in Moldova. The EBBA2 project thus provided a professional and financial frame for extensive ornithological research which ensured the coverage of major existing gaps related to species occurrence and distribution across the country. In order to provide accurate data, the Moldovan team carried out fieldwork during the 2016-2017 breeding seasons, following the EBBA2 methodology.

The standard Atlas grid was used (50x50 km squares), with an additional finer grid of squares (10x10 km) in order to carry out standardized surveys. As a result, data regarding occurrence, breeding evidence and abundance for all bird species was provided for a number of 26 50x50 km squares, while 138 out of 335 10x10 km squares was covered during the two years of fieldwork using the standardized approach. The EBBA2 project helped Moldova update critical data regarding poorly-studied species, such as Eurasian Eagle Owl *Bubo bubo*, Ferruginous Duck *Aythya nyroca*, European Nightjar *Caprimulgus europaeus*, and represented the most extensive ornithological research since Averin's "Birds of Moldova" (1971). Moldova's contribution to the EBBA2 also opened new opportunities towards a new National Breeding Bird Atlas, which will update the breeding status for many bird species and will strengthen the ornithological research in Moldova.

SESSION 5B – METHODS (AERIAL)

DIFFERENTIAL DETECTION OF WINTERING WATERFOWL DURING AERIAL AND TERRESTRIAL SURVEYS IN CAMARGUE, A METHODOLOGICAL APPROACH

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Situated in Southern France, Camargue is a 150,000 ha wetland of major importance in Europe for wintering Anatidae species and coots. Standardized aerial surveys were conducted during daytime on Greylag Goose *Anser anser*, Common Coot *Fulica atra* and nine species of ducks, monthly from September to March since 1964 by three successive observers, over ca. 150 sites in Camargue. In parallel, terrestrial counts were conducted on some of these sites, on the same species, over the last 25 years. Some factors are known to influence detection e.g. identity of observer, vegetation cover and method. To take them into account, we input both aerial and terrestrial counts in a hierarchical model run in a Bayesian framework that separates ecological process and detection process. The goal is to get an estimation with less uncertainty of the waterfowl numbers and a more straightforward dynamic picture of the spatio-temporal distribution of each species.

CALCULATING TRENDS IN SEABIRDS NUMBERS IN THE DUTCH PART OF THE NORTH SEA BASED ON AERIAL MONITORING

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In summer large numbers of species like Lesser Black-backed Gulls *Larus fuscus* and Sandwich Terns *Thallasseus sandvicensis* breeding in colonies along the Dutch coast forage at the North Sea, while during the migration periods and winter large numbers of non-breeding seabirds like gannets, scoters, kittiwakes and auks occur in the Dutch part of the North Sea. This part of the North Sea is monitored on seabirds by aerial surveys since the early nineties. Trends of seabird numbers are one of the targets in a much wider marine monitoring program and are considered as good indicators for environmental quality. Since 2013 the monitoring has been adapted in order to better match the information needs of the Birds Directive and OSPAR. The survey design was adapted in order to have a better coverage of the total North Sea and the designated Natura 2000 areas in particular. In addition, the methodology of recording seabirds was improved. With the use of a lower flying aeroplane with bubble windows and the application of distance sampling, a better identification of seabird species and more accurate recordings of densities were accomplished, especially of relatively scarce species. In this talk we discuss the methodological hurdles in combining the data of the old and new survey and present long term trends of seabirds. The total dataset has been analysed with the Rtrim software with month factors.

BALTIC SEA WATERBIRD TRENDS BASED ON IWC VS. OFFSHORE LINE TRANSECT SURVEYS: MATCH OR MISMATCH?

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The International Waterbird Census IWC provides an invaluable dataset for analyses of long-term trends of waterbirds worldwide. Monitoring counts cover a variety of habitats including the coastal zones of marine areas where they generate information on coastal waterbird communities. A number of marine species however concentrate mainly in the offshore waters in far distance from land and only smaller proportions of their populations occur in the coastal zone covered by land-based counts. In consequence it has been questioned whether IWC data adequately depict abundance trends of these offshore species. We compared abundance trends for Baltic Sea waterbird species derived by land-based IWC counts along the German Baltic Sea to results from offshore line transect seabird surveys. Offshore surveys have been carried out in the German Baltic Sea by boat and plane following the internationally standardized Seabirds at Sea methodology since the year 2000. From 2008 onwards, this survey methodology has been applied within the German Marine Biodiversity Monitoring carried out on behalf of the Federal Agency for Nature Conservation to fulfill reporting commitments according to the relevant directives of the European Union (Natura 2000, MSFD) and to the regional sea convention on the protection of the marine environment of the Baltic Sea area (HELCOM).

Results from the two different survey methodologies showed a surprisingly good match and produced the same direction of population trend for several of our study species such as the Common Eider *Somateria mollissima*, the Common Scoter *Melanitta nigra* and the Velvet Scoter *Melanitta fusca*. Abundance trends based on IWC data were often characterized by a steeper slope, i.e. a higher magnitude of population change. Population trends of gulls and divers showed differing results. For alcids, trends of the wintering population could only be derived based on offshore counts. Next to a comparison of the trend results based on data from the different survey methods, we present an integrated trend estimate. The combined trend estimate is derived as a weighted average, with weights relating to the reliability of the underlying estimate and the percentage of the overall population using the corresponding sea area (coastal or offshore). Our results demonstrate the value of an integrated approach for assessments of waterbird population trends using various available datasets from different sources.

EVALUATION OF THREE DIFFERENT SURVEY METHODS FOR MONITORING COMMON SCOTERS IN OFFSHORE WATERS

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Common Scoters *Melanitta nigra* are seaducks, characterised by dark plumage and a body length of about 50 cm. They have been listed as Endangered on the HELCOM Red List of wintering species following substantial declines of the wintering population in the Baltic Sea. The German part of the Baltic Sea hosts a major share of the biogeographic population of this species in winter and spring. In addition, Common Scoters use the Odra Bank in the Pomeranian Bay during the sensitive period of moult. The paramount importance of German sea waters for Common Scoters imposes a high national responsibility for their conservation, requiring adequate monitoring of numbers and trends. Accurately assessing abundance of Common Scoters is a challenging task due to their size, colouration and behaviour. Scoters are very sensitive to disturbance by ships and low-flying airplanes, in particular during the moulting period. We used three different methods, ship-based surveys, observer-based aerial surveys and digital aerial surveys, to estimate the numbers of Common Scoters on the Odra Bank during moulting and winter. All three methods face different challenges and problems.

We provide a general overview of the applicability of the three different survey methods for the monitoring of seaducks and present the results of several simultaneous surveys carried out during the last two years. Low-flying aerial observer-based surveys perform poorly during the sensitive moulting season, but better during winter. Ship-based surveys and digital surveys show reasonable performance during both seasons but are also impaired by weather conditions and logistic challenges. The findings are incorporated in the future implementation of the German Marine Biodiversity Monitoring with respect to survey design and analysis of long-term data for the assessment of population numbers and trends.

BEHAVIOUR OF BREEDING WATERBIRDS DURING MONITORING WITH UAVS

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In bird surveys with UAVs, it is important to ensure that the method used is not disturbing in itself. Waterbirds can perceive flying objects as birds of prey or other threats and therefore cause a flight reaction or anti-predator behavior, leaving nests susceptible to predation. We used a quadcopter in a number of breeding colonies of Herring Gull (*Larus argentatus*), Eurasian Oystercatcher *Haematopus ostralegus*, Eider *Somateria mollissima*, Great Cormorant *Phalacrocorax carbo*, Eurasian Spoonbills *Platalea leucorodia*, Black Guillemot *Cepphus grylle* and Sandwich Tern *Thalasseus sandvicensis*, and tested whether the UAV and the procedure of the flights, i.e. flight speed and altitude, had a disturbance effect on the birds. In a colony with Herring Gulls and Spoonbills we used an E384 fixed wing UAS as well. The majority of the breeding species did not respond to quadcopters during mapping of bird colonies and remained on their nests during flight. An exception was Black Guillemots breeding between the boulders of a pier, which all flew up from their nests and landed on the adjacent water. During flight with the E384 fixed wing UAV, several reactions were recorded. Opposite quadcopters, which takes off vertically, the E384 fixed wing UAV takes off horizontally, by throwing it into the air. The takeoff caused the nearest Herring Gulls and Oystercatchers to flush and leave their nests unattended for 1-2 minutes. During flight at an altitude of 50 m, approximately 60 Oystercatchers followed the E384 for one hour until landing. The behavior is an anti-predator behavior, in which the birds tried to "keep an eye on" or inhibit the potential predator by following it. This behavior was not detected when flying at an altitude of 70 m. Flying in transects using DroneDeploy or similar software when mapping bird colonies minimized the disturbance, compared to manual flying which are less predictable for the birds. The risk of disturbance by UAVs cannot be completely eliminated. However, we consider the potential impacts of UAVs on breeding waterbirds unlikely to be significant.

SESSION 6A – CAPACITY

ON THE IMPORTANCE OF MORE QUALIFIED ORNITHOLOGISTS, AND BIRDID IN PROGRESS

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A representative layout of routes in breeding bird surveys (BBS) is crucial in order to obtain reliable results in monitoring programs. This is mostly achieved by random layouts of the routes, and having many qualified volunteers to do the fieldwork. Lack of volunteers can make it impossible to start a BBS in a country, or can be problematic for countries with too few routes investigated. This is the situation in many East European countries. Qualified data from many of these countries are lacking, but highly needed. However, even in Western Europe the lack of volunteers might contribute to uneven coverage of the planned routes, for example that more routes are investigated close to cities than in remote areas. This can create biased results as bird population trends might differ between urban and rural areas or for example geographically from north to south. In that case, the investigated routes are not randomized despite the fact that the route layout is randomized. In the worst case scenario it might give politicians the reason to ignore the results. The www.birdid.no website has proved to be a successful tool to train on and learn bird identification, and offers the probability to take the formal exam on birds' appearance and bird sounds for documentation of the skills. The website and the BirdID App are open and free to all countries, and in 2017 students from 20 European countries took an exam here. In Norway, most volunteers in our national BBS program in 2017 have taken the exams. In addition, those who had completed the exam investigated relatively more routes and their fieldwork was more often approved than those without the exams. Both training and exams can be taken for the selected country, and for Russia even for specific parts of the country. The effect of the website training can be increased by following the BirdID field study run by Nord University. In 2018, nine countries did so, and eight new countries have the intention to do so in 2019. Of these 17 countries, 15 are from Eastern Europe. According to our experience, all countries should use the BirdID website to qualify their volunteers in BBS programs.

THE AFRIBIRDS EXPERIENCE: UPSCALING COMMON BIRD MONITORING IN AFRICA VIA THE UNESCO NETWORKS OF BIOSPHERE RESERVES

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The lack of bird observations and consistent monitoring schemes in Africa creates a large information gap, for understanding the population trends of Afro-Palearctic migrant birds, for weighing the different factors of decline operating either on birds' wintering grounds, breeding grounds or on migration routes and, consequently, for identifying ways to reverse the decreasing trends. The NABU surveyed the UNESCO network of African Biosphere Reserves to reveal their current knowledge, equipment and practices on bird monitoring and to identify the constraints to be removed so that African organizations managing protected area can play a proactive role in bird conservation. As a nucleus for standardized replication and potential expansion, a long-term bird monitoring and conservation scheme was adapted and implemented in two selected pilot sites at the Omo Forest Reserve in Nigeria and the Comoé National park in Ivory Coast. Under this project called AfriBiRds, five BirdLife organizations are involved to give a particular focus on common bird, where data gap are even more explicit in Africa. Each pilot monitoring team and ecological monitoring officers from 14 guest African biosphere reserves were conveyed on site to follow a training workshop on bird monitoring. The results of the workshop are compiled into a monitoring toolkit delivering field recommendations for bird identification and monitoring equipment, guidelines to set a common bird monitoring scheme in African protected area and tutorials to use mobile apps and internet platform for recording, managing and archiving bird observations and recommendations. The preliminary results from the two first field campaigns will be also presented with the lessons to be learnt from the Nigerian and the Ivoirian experiences and to sound promising replication of this initiative. AfriBiRds aims finally to contribute to the emergence of an African Bird Census Council and an Afro Bird Portal in collaboration with Europe.

ESTABLISHING NATIONAL BIRD POPULATION MONITORING SCHEMES IN AFRICA

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Indicators based on trends in the abundance of birds are widely used for monitoring the impacts of pressures on the state of nature, determining the effectiveness of policy responses, and tracking progress towards biodiversity targets and sustainable development goals in Europe and have been identified as priorities for development elsewhere. As part of this development, bird population monitoring schemes have now been established in Botswana, Kenya and Uganda, based on citizen science approaches used in Europe, with the aim of monitoring population trends in common and widespread species. The monitoring schemes were established in Botswana and Uganda in 2009 and in Kenya in 2011. From the outset, RSPB have provided technical and financial assistance. For Botswana and Uganda, we provide comparisons between trends of habitat generalists and specialists and of birds within and outside Protected Areas. Challenges encountered included recruiting, training and retaining volunteer surveyors, and securing long-term funding. However, we show that with technical support and modest investment, meaningful biodiversity indicators can be generated and used in African countries. Robust environmental monitoring is essential to support global and national biodiversity reporting mechanisms and to understand how the environment is changing. It is highly encouraging that Botswana, Uganda and Kenya now have structured bird monitoring programmes in place to help inform their National Biodiversity Strategies and Action Plans under the Convention on Biological Diversity, report against the Aichi Targets and Sustainable Development Goals; and inform their environmental policies and actions. We hope that this will encourage other countries to invest in well-designed, citizen science-based biodiversity monitoring for land birds and other taxa, complementing other essential biodiversity monitoring schemes that have been established in Africa in recent years. Finally, we review developments elsewhere that may enable progress towards a global wild bird indicator.

SESSION 6B – TRENDS: FARMLAND

COMPARING CONSERVATION STATUS OF COMMON FARMLAND BREEDING BIRDS IN DIFFERENT AGRICULTURAL SYSTEMS

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Thanks to its morphology and history, Italy hosts many different farmland landscapes. They can be grouped into three main agricultural systems: a) lowlands farmlands with the most intensive and modern agriculture (*e.g.* Po Valley); b) hilly areas mosaic farmlands, where agriculture is less intensive and the landscape is characterized by a significant presence of natural vegetation (*e.g.* the most part of central regions); c) the "Mediterranean pseudo-steppes" that comprise the extensive dry cereal cultivation (mainly in the Southern regions). Since 2009 Farmland Bird Index (FBI), a multi-species index composed by a set of 24 species, is calculated as part of a project funded by Italian Ministry of agricultural, food, and forestry policies. Aiming at better understanding the actual conservation status of farmland species in Italy, we calculated FBI for each of the three main agricultural systems, and we tested by means of MSI-tools, the differences among them and with the national index. Moreover we tested the presence of possible differences in population trends among different ecological guilds and taxonomic groups.

The National FBI shows a moderate decline over the study period (about -20%); this apparent simple picture hides a very dynamic situation with opposite trends among species and strong differences within the three main agricultural systems. Lowland farmland breeding birds shows the steepest decline, highlighting the negative impact of modern and intensive agriculture on biodiversity. This is particularly true for ground-nesting species and for species that breed in heterogeneous landscapes. On the contrary, these species, and the FBI itself, show a better trend in the Hills system. Mediterranean steppes, a very important area, especially for larks, seems to host the best conserved farmland breeding birds community, with the FBI showing the best performance. Understanding these differences and patterns is of pivotal importance to set the most effective conservation policies.

TEN YEARS AFTER - A LOOK INTO THE EFFECTS OF HABITAT FRAGMENTATION ON MEDITERRANEAN FARMLAND BIRDS

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In 2005, bird species abundance was surveyed in the Mediterranean farmlands of the Special Protection Area (SPA) of Castro Verde and the relationship of several species to distance of forest edges was measured, taking into account landscape context and habitat fragmentation along farmland landscape. After ten years, some of the younger forest plantations, had grown and matured. Some parts of the area were affected by practices of agricultural intensification and several others suffered from the progressive land abandonment in the interior region of the Country. Our work aims to understand and quantify the impacts of these changes on the birds inhabiting the region, with particular focus on farmland birds. Censuses were performed on the same areas to allow for a comparative analysis between the data from 2005 and 2015, focusing on the trends of species abundance, richness and guild-specific impacts.

We observed an increase in the number of species recorded (47 to 68; 31% increase) and overall abundance (15.8 to 23.8 birds per transect sampled; 33% increase) suggesting a positive effect on the overall community. However, while some of the open farmland species followed the general increasing trend, such as the Corn Bunting *Emberiza calandra*, the Little Bustard *Tetrax tetrax* and Cattle Egret *Bubulcus ibis*, other emblematic species such as the Calandra Lark *Melanocorypha calandra* or the Greater Short-toed Lark *Calandrella brachydactyla* saw their numbers greatly decrease. Our results emphasize the need of applying informed conservation measures to preserve the currently unique setting of open farmland avian diversity.

DRIVERS OF POPULATION CHANGE IN COMMON FARMLAND BIRDS IN GERMANY

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Farmland bird populations in Germany are declining at a higher speed than species groups inhabiting other habitats. We present an extensive analysis of potential causes for population change based on bird data from standardised German breeding bird monitoring schemes and variables describing environmental changes in the agricultural landscape in Germany, weather conditions during the breeding season and for migratory species conditions at stopover and wintering sites. Different analysis methods were used to analyse effect strength at species level and conclusions are drawn for the overall group of farmland bird species. A comparison of regional farmland bird trends in Germany with adjacent regions of other European countries showed in many cases similarity in the development of bird populations inside and outside Germany indicating similar drivers across national borders. For Germany, despite a consistent but slight influence of breeding season temperature across species, the negative trends seen for farmland birds were best explained by changes in land use due to agricultural intensification.

The extent of grassland and fallow land were shown to have the strongest positive associations and the extent of maize and rapeseed the strongest negative associations on farmland bird populations in Germany. Individual species however varied in their response to changes in land use variables. For robust and detailed causal analyses, bird monitoring data critically depend on a variety of other data. Increased fine-scale monitoring of environmental variables likely determining the state of bird populations could greatly expand future inference from monitoring schemes. The work presented was supported by the Federal Agency for Nature Conservation (BfN) with funds provided by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

SESSION 7A – CLIMATE

PRECIPITATION DEFICIT OR INCREASED WARMING? WHICH ONE IS DRIVING THE IMPACT OF CLIMATE CHANGE ON MEDITERRANEAN BIRD POPULATIONS?

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Climate change is often equated to climate warming because it's more prominent global effect is the increase of temperature. In Europe as a whole, as well as in their temperate and boreal regions, there are already strong evidences that temperature rise is shifting bird populations and communities. However, this general pattern has not been clearly found in the Mediterranean region, where the majority of ecosystems are more shaped by water availability than by temperature constraints, and where climate change is also associated with decreased rainfall. In this study we compared the part played by temperature and precipitation preferences in driving bird population trends in Catalonia (north-west Mediterranean basin). Trends were estimated with long-term monitoring data and the temperature and precipitation preferences were calculated using atlas data.

Bird population trends were linked to precipitation but not to temperature. The most serious population decreases was found in bird species inhabiting humid habitats. We also carried out the same type of analyses for butterflies and found the same importance of the requirements of precipitation and the lack of relation to temperature. However, for this group of invertebrates, the species decreasing the most were associated to arid environments. Our results indicate that water constraint is a more important driver of biodiversity change than climate warming in the Mediterranean region, although it may have highly contrasting impacts on different taxonomical groups.

CONSERVATION OF WINTERING WATERBIRDS IN THE MEDITERRANEAN: STATE, THREATS AND EFFECTIVENESS OF CONSERVATION MEASURES

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We have focused on the conservation of wintering waterbirds in Mediterranean wetlands, studying the impact and interactions of key drivers of change on waterbird communities. Despite a historically degraded conservation status, waterbirds have benefited from the regulation of hunting and control campaigns through the Bern Convention and the Birds Directive. They also have profited from the designation of protected areas by the Ramsar Convention and the legislative framework giving importance to the conservation of wetlands and their biodiversity. These benefits are spatially heterogeneous, as is the magnitude of the drivers of change. Waterbird communities can adjust to global warming by a northward shift in the wintering range of species, particularly those that traditionally winter in the southern Mediterranean. This adjustment is possible when natural habitats are preserved and when species enjoy a strict protection status. Community adjustment is facilitated by the conservation measures implemented in countries where the Bern Convention has been ratified. The measures for the conservation of habitats and species undertaken under the Bern Convention, and reinforced by the Birds Directive, seem to relieve the pressures of land use change and hunting, and facilitate the adjustment of wintering waterbirds to global warming.

RAPID CHANGES IN ELEVATIONAL AND LATITUDINAL DISTRIBUTIONS OF BREEDING BIRD ABUNDANCES IN SWITZERLAND

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To demonstrate the consequences of the massive and rapid current environmental change, it is essential to follow the modifications of the distribution and abundance of species. However, high-resolution long-term monitoring schemes are still rare and this often impedes the precise description of medium and long-term evolutions. Between 2013 and 2016, the Swiss Ornithological Institute organised the field work for the fourth Swiss breeding bird atlas. For this project 5% of the Swiss territory has been covered by territory mapping in single square kilometres (2,318 in total) that had partially already been mapped 20 years earlier. Thanks to a rigorous modelling work, we obtain a detailed picture of the changes in abundance that occurred in the last 20 years for 71 of the most common species. Based on the modelled changes in the abundance distribution of these species, we examined how altitudinal and latitudinal distributions changed in the last two decades.

On average species increased their mean altitudinal distribution by 24m. There is also a positive correlation between mean species elevation and elevational change over the last 20 years; species living in higher altitudes showed a stronger upwards-shift. These results are important to plan conservation action for the future. The Alps become an increasingly important refuge for lowlands species under pressure of environmental changes. Anticipating how bird distributions might change in the near future could be of key importance to design conservation plans.

PREDICTING THE EFFECT OF CLIMATE CHANGE IN FENNOSCANDIAN BIRDS

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Species distribution models (SDM) are increasingly used to predict the effects of climate change on various organisms. However, many studies have been criticized for using over-optimistic model validation methods which are unsuitable for extrapolative models. We argue that extrapolative models should be evaluated based on how well they predict changes in a population, not a static situation. We asked whether SDMs produce reliable predictions, whether prediction accuracy is scale dependent and whether predicting is especially challenging for some types of species? We used a joint species distribution model to predict changes in occurrence and abundance of 127 Fennoscandian bird species. We fitted the model with data from 1975-2006 and made predictions for past (2003-2006) and future (2013-2016) time periods. We measured the difference between these two periods, both for observed and predicted values. Prediction accuracy was then defined as the correlation between observed and predicted changes.

We found that predicting change was difficult for both occurrence and abundance at local (2x2 km) scale but improved when done at regional (50x50 km) scale. At larger scale data is less affected by stochasticity. We found that predictions were more successful for common species from cultural habitats. Vice versa, rare species from forest habitats were difficult to model. Common species accumulate more observations than rare thus making data-driven modelling easier. Cultural habitats are more homogenic than forests and therefore more predictable. Although conservationists would prefer precise, local predictions, we cannot yet make them reliably. However, predicting at a larger, regional scale is more reliable. Our results reveal which life history traits impact species predictability and help to understand how those traits affect predictability. With these results we have a framework for model interpretation which becomes critical when model validation is not possible, such as when forecasting to future predicted climate change.

WINTERING BIRD COMMUNITIES ARE BETTER TRACKING CLIMATE CHANGE THAN BREEDING COMMUNITIES IN EUROPE AND NORTH AMERICA

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Species distributions and abundances are shifting towards high latitudes or altitudes in response to climate change. However, the spatial variation in the speed of climate driven bird population changes, especially during non-breeding season, is not well understood. By combining large-scale, long-term, multi-species data on breeding (summer) and non-breeding (winter) bird communities across Europe and North America, we investigated two macro-ecological questions: 1) Are community changes associated with changes in temperature? We predict that annual changes in species communities are explained by the annual temperature changes. 2) Are there seasonal differences in community responses to climate changes? We expect changes in communities to be faster during the winter season compared to summer season because temperature has changed faster during winter, and because individuals can more readily move their non-breeding areas. We used community temperature index, CTI, to measure changes in communities in 67 countries (Europe) and states (North America).

Annual changes in winter CTI correlated weakly positively with annual changes in winter temperature, but not during the summer season), partly supporting our first hypothesis. Furthermore, long-term changes in CTI have been significantly greater during winter than during summer, supporting our second hypothesis that winter communities have changed faster than summer communities. The majority of climate change studies on animals have concentrated on their reproductive season, whereas our study highlights that responses can be much faster during the non-reproductive season. Concentrating research on breeding season may thus underestimate overall effects driven by climate change.

SESSION 7B – CITIZEN SCIENCE: TRENDS

INFORMATION TECHNOLOGIES IN A NEW CITIZEN SCIENCE BIRD MONITORING SCHEME: METHODOLOGICAL ADVANCES AND FIRST RESULTS

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Volunteer-based bird monitoring schemes are invaluable tool for collecting information about bird populations. Involvement of a high number of volunteer observers enables considerable spatial coverage resulting in robust data on population trends and estimates of population size. However, relying on voluntary observers compromises the amount of information acquired in the field: census techniques must be simple to avoid observer biases and collection of non-standardized data. Thus the information crucial for an assessment of bird detectability or species' habitat preference are usually rough or missing in the traditional counting designs. Here we present a new voluntary-based bird monitoring scheme which keeps the advantages of a simple field protocol, but maximizes collected information using modern technologies. We launched this new scheme to monitor breeding and wintering bird populations in Czechia in 2018. Based on stratified random selection of sampling plots, our scheme relies on observers walking along the 1 km transects in 1 hour and recording the exact geographic position and activity of each observed bird individual into a map in their smartphone or tablet. Position of an observer and time is automatically recorded at each observation too.

Although the scheme seems to be more demanding for observers' skills than point counts used in the Czechia before, the uptake was 52 observers (75 plots, 20,000 individual detections) in the first year. Among others, observers appreciate that no further data processing is needed because the data is sent to a central database right from the app used in the field. We used these data (i) to compare the raw abundance estimates with the estimates accounted for imperfect detection in selected species and (ii) to compare bird diversity among various habitats. Providing first results to volunteers facilitates feedback necessary for continuation and further development of this monitoring scheme.

POPULATION TREND ESTIMATION FROM SEMI-STRUCTURED CITIZEN SCIENCE DATA

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There is wide interest in using semi-structured data to calculate population indices for countries, regions, and species where more formal monitoring schemes are absent or have limited coverage. Previous comparisons of survey data with semi-structured records have produced mixed results, suggesting that the utility of semi-structured data increases with the amount of knowledge about recording effort and ability to control for biases in space and time. Comparisons are further complicated by the fact that survey-based population trends are based on abundance data, whereas less structured data often only provide estimates of trends in occupancy. Here we focus on the potential use of data from complete BirdTrack lists to provide population trend estimates for species that are too rare to be well covered by the UK Breeding Bird Survey (BBS), yet common enough to not receive dedicated coverage by the Rare Breeding Birds Panel. A similar knowledge gap is likely to occur in much of Europe and North America. We prepared abundance and occupancy trends for a selection of common and rare UK breeding birds based on BBS data for the period 2005-2016. Occupancy trends based on complete BirdTrack lists were prepared for the same species and time span.

We found that abundance and occupancy were closely correlated for common species, but that the abundance-occupancy relationship was less pronounced, and less certain for rarer species. BBS and BirdTrack occupancy trends followed similar patterns over time, but differed in scale, with occupancy trends based on BirdTrack data generally showing less pronounced changes. Our work highlights opportunities for developing analytical frameworks that combine information from structured and less structured schemes.

CAPITALIZING ON OPPORTUNISTIC DATA TO REFINE BIRD POPULATION TREND ESTIMATES

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Citizen science programs have been increasingly developed for bird monitoring during the last 20 years. Statistically valid sampling designs and standardized protocols are recommended to monitor species abundance variations, and citizen science is a way to mitigate financial and human resources issue as it provides numerous data at lower cost than when they are collected by professionals. Standardized data, however, do not always have sufficient spatial and temporal coverage to get meaningful indicators. Opportunistic data - collected by amateur naturalists without protocol - are another potentially valuable source of information on bird population changes, their number having increased greatly through the online citizen science databases worldwide. Despite being very abundant, opportunistic data cannot be used easily with current statistical tools because of data quality issues and the difficulty to model observer behaviour outside standardized schemes. These data being collected without documenting the observation pressures, several statistical locks (spatial and temporal heterogeneity of the observation pressure, heterogeneity of the quality of the data) must be lifted in order to obtain reliable information. Here, we aim to produce population trends at a regional scale in France while taking such inherent biases not account. To do so, we took advantage of a recently developed statistical framework relying on data combination. Using both opportunistic data from the VisioNature database and standardized data from the French Breeding Bird Survey, we extended the spatial model to obtain estimates of quantitative changes in relative abundance over time.

Combining opportunistic data with data collected through schemes characterized by a known sampling effort can result in more accurate estimations of temporal trends than with standardized data alone, particularly for rare species. As such, opportunistic bird count data provide the opportunity to improve the reliability, scope and accuracy of biodiversity indicators.

SUCCESSES, LIMITATIONS AND FUTURE PROSPECTS IN ASSESSING POPULATION TREND AND DISTRIBUTION OF OWLS AND NIGHTJARS USING CITIZEN SCIENCE

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Owls and nightjars share nocturnal habits that require specific census methods. These bird groups are frequently under-studied because of the difficulties associated with censusing species that are not very abundant, are often elusive and are detectable mostly only night. As citizen science can be a valuable means to increase our knowledge on the population trend and distribution of owls and nightjars, in 2010 the monitoring program "Noctua-Portugal" started to be implemented in continental Portugal. It consists on sampling visits carried out by volunteers to five points in a 10x10 km square grid.

Nine years of sampling have produced reasonable population trend estimates for the most common species, whereas only imprecise or no estimates were obtained for the less common species. However, this is the only data available on population trends at the country scale and it has been used namely to address legal commitments like EU Birds Directive and Red Data Books. Results from Noctua-Portugal program (2010-2018) suggest a negative trend for the Barn Owl *Tyto alba*, Scops Owl *Otus scops*, and Little Owl *Athene noctua*, alerting to a possible status of conservation concern. The Noctua-Portugal program only had a modest contribution to determine species distribution, while most of this information originated from records from public online databases, especially eBird, and from occasional records sent by Noctua-Portugal participants. The number of owl and nightjar records inserted in online databases has been growing, but more remote areas of Portugal still have insufficient information. The main limitations along these years have been low participation of volunteers and analytical constraints associated with small sample sizes. Future actions may include methodological changes to motivate volunteers and to increase analysis robustness.

MALLARD POPULATION DECREASES IN THE NETHERLANDS, WHY? EXPLORING POPULATION DYNAMICS OF MALLARD AND GADWALL

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The Dutch breeding population of Mallard *Anas platyrhynchos* has decreased by about 30% since 1990. This decline is apparent in most landscape types within the country and has no parallel in neighbouring countries. Driving factors may therefore be found in The Netherlands. In addition, the wintering population, consisting of both resident and migratory birds, has shown a steep decrease by 25-30% since 2000. A decline in wintering numbers is also visible at the scale of the Northwest European flyway. These negative trends contrast strongly with the positive population development of Gadwall *Mareca strepera*, an ecologically closely related dabbling duck species. Dutch breeding and wintering populations of Gadwall have been increasing for decades. This increase is visible throughout Europe and can partly be attributed to a flexible response of the species to new habitats or changes in habitat suitability. As an aquatic herbivore the Gadwall obviously copes with both eutrophication of waters and the current improvement of water quality (de-eutrophication). Hatching success in both Mallard and Gadwall is stable for the Dutch populations and comparable to that in populations elsewhere. Survival of fully grown birds in both species has increased, especially that of first year birds. Lower hunting pressure seems to play an important role.

This suggests that problems for Mallard mainly occur in the part of the life-cycle for which almost no data are available: the chick period and/or the first months after fledging. Possible explanations for this will be discussed. The cause of the decline in wintering numbers, as far as it does not apply to Dutch breeding birds, is unclear. However, a shift in wintering distributions within Europe does not seem to play a major role.

SESSION 8A – TRENDS & INDICATORS

POPULATION TRENDS AND BREEDING DISTRIBUTION OF WADERS ON THEIR BOREAL AND ARCTIC BREEDING GROUNDS IN NORTHERN EUROPE

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Large-scale and population-wide monitoring of waders on their boreal and arctic breeding grounds are hard to come by, not least due to challenging logistics. In Norway, Sweden and Finland ('Fennoscandia') there are now similar and directly comparable monitoring schemes in place. Line transects of 6-8 km are distributed in a grid representative to both geographical position and habitat type. We present joint Fennoscandian population trends for 25 wader species, based on 9,578 surveys of 1,478 unique routes from 2002–2017. This 1 million km² area largely coincides with the boreal and arctic parts of Fennoscandia (58–71°N).

For Common Sandpiper *Actitis hypoleucos* (-2.0 %/yr), Ruff *Calidris pugnax* (-4.1 %/yr), and Spotted Redshank *Tringa erythropus* (-3.9 %/yr) the trends are significantly negative. For Common Ringed Plover *Charadrius hiaticula* (+4.1 %/yr), Eurasian Dotterel *Eudromias morinellus* (+6.5 %/yr), Wood Sandpiper *Tringa glareola* (+1.1 %/yr), Green Sandpiper *Tringa ochropus* (+3.0 %/yr) and Common Redshank *Tringa totanus* (+4.2 %/yr), the trends are significantly positive. Among the 17 species with non-significant trends, 5 were numerically positive and 12 negative. The average species trend declined by 1.0 %/yr (se = 0.6, n= 25), but not significantly so. We conclude that overall the boreal and arctic waders of Fennoscandia have fared reasonably well the last 16 years, although the general tendency for negative trends warrants further careful monitoring. The average number of species recorded per route and census, increased 0.24 per degree latitude. The average number of wader pairs per 10 km line transect increased by 2.48 per degree latitude.

POPULATION TRENDS OF BIRDS IN EUROPEAN RUSSIA: RESULTS OF THE PROJECT 'EUROPEAN RED LIST OF BIRDS'

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Results of the project executed in 2013-2014 by the group of Russian ornithologists are analyzed for 400 bird species subdivided in clusters separately on a base of habitats use and systematics. Due to poor investigation and huge territory, population trends for 24.3% of species are still unknown. Comparison of trends for three habitat clusters: woodland species, species of open treeless habitats (farmlands, tundra rural and urban areas) and mountain species shows that the cluster of mountain birds is in the worst condition: 47.8% of species declined in numbers. Situation with species of open habitats is better: 22.3% declined. The best picture demonstrates woodland birds: only 12.0% of species with negative trend. Separate analysis of 21 systematics clusters shows the worst situation in the clusters Gaviiformes and Podicipediformes; Alaudidae and Motacillidae; Paridae, Sittidae, Certhiidae and their allies; Anserinae and Tadorninae, where the share of species declined in numbers was 42.9%, 33.4%, 31.3 and 30.8% accordingly. The safest clusters, in which the share of species with increased numbers is more than 30%, are clusters Pelecaniformes and Ciconiiformes; Accipitriformes; Strigiformes; Hirundinidae and Sylvidae. The share of species with decrease in numbers in all these groups except for the first does not exceed 16%. The probable reasons of decline and increase in numbers in different clusters are discussed. Comparison of population trends in strongly differing conditions of land use in European Russia and in the other countries of Europe has allowed to determine for some species where the main negative factors take place: within the breeding range or outside it – in wintering grounds and stopover sites.

TRENDS OF GLOBALLY SIGNIFICANT BIRD CONGREGATIONS IN TURKEY

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Located at the junction of three continents, Asia, Africa and Europe, Turkey hosts an exceptionally rich and diverse avifauna. Several globally significant bottleneck areas for soaring birds are located in Turkey, including the Bosporus (Istanbul), Eastern Black Sea Mountains (including the Çoruh Valley) and Amanos Mountains (includes the Belen Pass). Moreover, Turkey's wetlands, grasslands and coasts function as key congregation areas for several species at different stages of their life cycle, including waterbirds and some seabirds. These congregations may sometimes exceed 90% of the known world populations of a number of species, such as for the Yelkouan Shearwater *Puffinus yelkouan*, White Stork *Ciconia ciconia*, Lesser Spotted Eagle *Clanga pomarina* and the Sociable Lapwing *Vanellus gregarius*. Congregations at such a high magnitude are widely used for selection of priority areas for conservation, such as with the Important Bird Area and Key Biodiversity Area approaches. In this study, we assessed the trends of such critical bird congregations in Turkey, based on mid-winter counts and other available literature for individual concentration areas. Our study indicates several major trend changes for some of the species assessed, which inform both global population assessment efforts and conservation strategies at the flyway level.

BIRDS AS INDICATORS OF WETLAND CONSERVATION IN EUROPE

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Research has shown that wetlands are home to some of the richest biodiversity on the planet, providing myriads of ecosystem services of critical importance to both local and global communities. Yet, they are counted among the most threatened ecosystems on Earth. Human-related processes such as population growth, urban expansion, land conversion and pollution are some of the main drivers of wetland loss and degradation. Numerous efforts are being undertaken to promote conservation and sustainable use of wetlands, including the improvement of biodiversity indicators to estimate changes in wetland biodiversity. Because of their sensitivity to environmental changes, birds are being increasingly used as indicators to assess the general state of wetlands. Based on three case studies from Spain, France and Finland, this work provides first-hand evidence of the use of birds to assess the conservation and management of wetlands.

With different data collection techniques ranging from social to ecological sciences, the three studies show how birds can be good indicators to measure the state of wetlands, the pressures that they face and their responses to different management actions, with positive (*e.g.* habitat protection) and negative (*e.g.* drainage) effects for biodiversity. When data collection methods are robust enough, the results obtained can shed light on the main challenges and potential solutions to conserve wetland ecosystems. Integrating social and ecological data may thus represent a good strategy to further our understanding about the status and trends of certain species. However, determining the general state of wetland biodiversity requires a broader evaluation involving other taxonomic groups to further develop conservation actions, especially when habitat data are not available. Altogether, this collection of case studies is conceived as an integrative approach to advance the use of bird indicators for wetland conservation.

BIRD POPULATION TRENDS IN THE BALTIC SEA – WHICH TRAITS SET WINNERS AND LOSERS?

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The Baltic Sea holds large numbers of wintering waterbirds and its coast is important for breeding of many waterbird species. During the past decades, the ecosystem of the Baltic Sea has experienced significant changes causing major shifts in biodiversity. We analysed population trends of the breeding and wintering waterbirds to identify traits associated with winners and losers and explain differences among the groups. For wintering birds, we used International Waterbird Census data from the entire Baltic Sea to calculate population indices and abundance trends of mid-winter waterbird populations for the period 1991-2016. As overwhelming majority of data came from land-based counts, we limited the species list to those 22 species predominantly wintering in the Baltic coastal waters. We used GAM modelling framework and accounted for effects of site, year and the temperature during one week before the counts to estimate indices and trends. For breeding birds, we used data from national monitoring schemes to calculate population indices and abundance trends of breeding waterbird populations along the Baltic Sea coast for the period 1991-2016. We used TRIM modelling framework to estimate indices and trends.

Out of 22 wintering species included in the analysis, eight showed significant positive trends, with the strongest increase in Smew *Mergellus albellus*, four species significantly decreased, with strongest declines recorded for Steller's Eider *Polysticta stelleri*, nine were stable and one – uncertain. Out of 29 breeding species included in the analysis, eleven showed significant positive trends, with the strongest increase in Common Tern *Sterna hirundo* and Great Crested Grebe *Podiceps cristatus*, seven species significantly decreased, with strongest declines recorded for Dunlin *Calidris alpina*, nine were stable and one – uncertain. Among wintering birds, trends of ground-breeding species were significantly more negative than those of tree-nesting species. All species breeding in the Arctic were declining while the overwhelming majority of those predominantly breeding in taiga zone were increasing. Non-colonial breeders of the temperate zone showed a wide variety of trends while almost all colonial breeders were increasing. Among breeding birds, the most prominent distinction of trends was by the wintering area and functional group (feeding guild) of the species. Among species wintering in Africa, wading feeders did significantly worse than surface feeders (terns). Surface feeders wintering in NW Europe including the Baltic Sea (gulls) showed significantly more negative trends than the Africa wintering terns. Within the species groups predominantly wintering in NW Europe, the overwhelming majority of benthic feeders were declining while pelagic feeders and waders were increasing. Our results stress the strong influence of factors acting outside the Baltic Sea on abundance trends of waterbirds within the region.

IDENTIFYING SPECIES' POOLS FOR INDICATOR SPECIES SELECTION

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Multi-species indicators are embedded in environmental management, sustainable development and biodiversity conservation policy and practice, acting as metrics against which progress towards national, regional and global targets are measured. The choice of species included in an indicator has a defining influence on how well it reflects ecosystem condition, the speed and extent to which it responds to environmental change and the confidence intervals around its metric value. When choosing species to act as informative indicators, approaches often rely on expert opinion or data availability; generally applicable and objective methods for species' selection are frequently lacking. We endeavour to address this issue by employing an objective measure of species' relative habitat use (RHU) to define the pool of species from which an indicator set can be drawn. Taking the development of a European Forest Bird indicator as a model system, we use Pan-European Common Bird Monitoring Scheme (PECBMS) data to quantify RHU for a suite of European breeding birds and quantifying reliance on forest habitats accordingly.

We explore regional variation in RHU, examine how RHU has varied over recent decades and discuss the implications for defining the pool of species from which a forest indicator set should be drawn. Finally, we demonstrate how this process can be combined with an existing indicator species selection protocol to construct a European Forest Indicator. Integrating these approaches provides us with an effective protocol for informative indicator species selection which is of growing demand from policy makers and stakeholders for greater consistency and standardisation in species selection.

30 SEASONS OF CORNCRAKE MONITORING IN LATVIA 1989–2018: EXPERIENCE WITH VOLUNTEERS, TRENDS AND POPULATION ESTIMATES

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Corncrake *Crex crex* monitoring in Latvia was organized under Latvian Ornithological Society (LOB) since the field season of 1989. Over 70 sample plots and around 100 volunteers have been involved in the Corncrake monitoring up to 2018, although the activity of observers has been various from only 4 routes covered in 1989 up to 50 routes in maximum year of 2003 (~26 routes annually). We used the data and TRIM program to calculate the long-term trend of the Corncrake population in Latvia of 1989-2018 (stable) and short-term (5 year) trend (moderate decline, $p<0.05$). We used the data also to access the habitat use and changes in habitat use over the study period according to the land use change in agriculture in Latvia. We also used the data to estimate the breeding population of the corncrake in Latvia by two methods:

For the first method the habitat specific "breeding density" (=calling males per square kilometer of each specific habitat) was calculated: (1) after two surveys number of territories were determined – if 2 males were observed >250 m apart, they were considered two individuals; (2) territory density per habitat area in each plot and country average was calculated; and (3) total population calculated by the use of national agricultural land use data open to public after each year. For the night bird survey we attributed each Corncrake to one of the following (consistent to the categories used in the land use data): (1) cultivated meadows; (2) uncultivated meadows; (3) cultivated pastures; (4) uncultivated pastures; (5) spring crops; (6) winter crops; (7) other arable land; (8) abandoned agricultural land; (9) clearcuts in forests; (10) other. For the second approach, the same data (night bird survey) as for the first method was used. We used hierarchical modelling to relate Corncrake counts to site level habitat composition while accounting for imperfect detection. The obtained model was used for prediction over a grid covering the whole country.

MONITORING SCHEMES IN PORTUGAL, TRENDS, CHALLENGES AND FUTURE

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Monitoring schemes are fundamental tools to access changes in abundance and distribution patterns of bird species and/or communities. Additionally, they provide up-to-date information, fundamental to design successful conservation measures and optimal management decisions. In Portugal the majority of these schemes are coordinated by NGO's or the National Conservation Institute, except a few schemes leaded by research groups. In this talk we will present an overview of the monitoring schemes in Portugal based on the publicly available information, since this is a fundamental tool to provide feedback to the volunteers and general public, but also to policy makers. The oldest monitoring scheme is the Wintering Waterbird Census running since 1976, while most schemes started after the year 2000 (*e.g.* Christmas and New Year Census (CANAN) – 2003, Common Bird Survey – 2004, NOCTUA – 2009). Most schemes have a multi-species approach or are focused on a particular group (*e.g.* Ardeidae), with few regular schemes targeting only a single species (*e.g.* Red Kite *Milvus milvus*). Except for the national Atlas, the number of volunteers involved is small (<100 participants/scheme) and this could be in part linked to insufficient feedback provided. Although most of the schemes occur in an annual basis, only three schemes are up-to-date with reports (winter Red Kite census, CANAN and NOCTUA). We analyze the results for all monitoring schemes based on the information available, focusing on the temporal series, the geographical coverage, and public engagement. We discuss the accuracy of the trends observed and their extrapolation for the overall populations. We identify where are the information gaps and suggest the priorities for monitoring, hopping that this promotes more sustainable schemes and a wider public engagement.

SESSION 8B – CITIZEN

YEAR OF THE …: HOW STARRING A SPECIES CAN BOOST KNOWLEDGE AND CONSERVATION

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Organizing a "Year of the …" has appeared to be a successful way to collect more information about a single species, such as its distribution, numbers, vital rates and ecology, using the efforts of dedicated volunteer observers. Moreover, bringing a species into the spotlights can boost both in-depth research and conservation efforts. Furthermore, "Years of" turn out to be ideal vehicles to reach the general public. Since 2002 Sovon and BirdLife have been calling out Years of the Bird in the Netherlands. Prior to every such year, a species is chosen and an overview of the existing knowledge is made. Resulting from the most important knowledge gaps, specific questions are formulated. These focus on topics such as mapping the distribution of a scarce species (*e.g.* Northern Wheatear *Oenanthe oenanthe*), assessing habitat choice (Barn Swallow *Hirundo rustica*) and quantifying breeding success (Starling *Sturnus vulgaris*, House Martin *Delichon urbicum*). Every year we use a citizen science approach, preferably offering different levels of participation, to address different types of volunteers. Often, increased data collection is sustained in later years. In 2014 we loaned 100 nestboxes with infra-red cameras to volunteers to collect data on nest success of Starlings, which has resulted in significant more nest records ever since. Sometimes, even professional research programs are established as spin-off. Starring the Northern Wheatear in 2005 resulted in a long-term study on demography and science-based conservation management. Communication is an important part of the project design and includes recruiting volunteers and informing stakeholders. In the Year of the House Martin hundreds of volunteers distributed more than 20,000 flyers amongst residents, hereby launching a charm offensive while investigating colonies. In our presentation we will present both organizational issues and some results of Years of a Bird.

PROJECT OWL: LONG-TERM MONITORING OF A NOCTURNAL SPECIES OF NATIONAL CONSERVATION CONCERN

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Tawny Owl *Strix aluco* is a species of conservation concern in Great Britain. Estimated population trends from large scale breeding bird surveys suggest a shallow but continuing downward trend since the 1970s. However, as with other nocturnal species, they are poorly monitored by standard surveys which take place during the day. For these reasons the British Trust for Ornithology carried out two targeted surveys with different levels of participation and structure. The Tawny Owl Point Survey was the third of similar surveys carried out in 1989 and 2005 and consisted of multiple visits to random preselected tetrads, conducted within the two hours after sunset in late summer and early autumn. The point survey was aimed at estimating trends in range, geographical patterns and habitat association. By using occupancy models we estimated detection and occupancy probabilities and their association with habitat. We also examined the rates of extinction and colonisation between the surveys and whether these differ in different habitats. The Tawny Owl Calling Survey was the second of a similar survey carried out in 2005 and consisted of asking citizens to listen for owls in their gardens and other self-selected locations for one evening a week for as many weeks as they could for six months. The calling survey was aimed at assessing the impacts of urbanisation, weather conditions and other factors on Tawny Owls' calling behaviour and our ability to detect their presence.

INCREASING THE ACCESSIBILITY AND VALUE OF CITIZEN SCIENCE DATA

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Maximizing the realized value of citizen science data requires increasing the number of uses and users of these data. Making raw data widely available is one way in which their use can be increased. However, making the raw data publically available is not sufficient for insuring that these data are widely used; the large volume and complexity of data collected in a large-scale citizen science project creates challenges for accessibility and analysis. Similar accessibility challenges have arisen in a number of big data applications across a variety of disciplines, and a variety of solutions have been proposed. In this talk we will discuss strategies for enabling easier access to useful biological information, using examples from our work with the broad-scale monitoring project eBird. First, we will describe approaches for making the raw data more accessible for researchers. Second, we will outline the role that supplemental documentation — advice and guidelines for best practices — can play in insuring that robust ecological inferences will emerge from analyses. Third, we will make a case for producing a range of derived data products and associated software tools to eliminate the need for all potential users to undertake computationally expensive analyses. We will illustrate this third point with "eBird Status and Trends" products, which include standard and advanced analytical products that are available for ornithologists and conservationists. We believe that a diversity of products, targeted to different audiences, need to be produced and disseminated from large citizen science projects in order to increase the value and potential of these projects to contribute to bird conservation.

THE ROLE OF ON-LINE TOOLS FOR THE MANAGEMENT OF DATA FOR THE SECOND EUROPEAN BREEDING BIRD ATLAS

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Thanks to new information technologies, the possibilities of running large-scale atlas and monitoring projects have nowadays attained a level that was difficult to imagine just a few decades ago. One of the fields in which information technologies have improved communication and data management in such projects are on-line databases and associated tools. In this presentation, we explain how the New European Breeding Bird Atlas EBBA2 has benefited from this development in a variety of aspects that have undoubtedly contributed to the quality of the final atlas outputs. Several on-line databases have been developed for the management of data for this pan-European project. A first tool allowed national coordinators to directly upload data, check for the consistency of formats and properly visualise their own data in form of zooming maps, as well as to share them with national experts and provide data to European coordinators. A second tool allowed national coordinators to check for potential errors using a number of automatic procedures flagging unusual records with regard to known breeding ranges or regional phenology. Finally, a third tool adapted to different types of users with different roles allowed to check for potential taxonomic issues in the data (*e.g.* inconsistencies between countries), and to agree on abundance values in cross-border squares, thus facilitating collaboration of national coordinators of neighbouring countries. Overall, these tools represent a coordinated working platform that improves the capacities of early detection of potential errors and ensures the best possible final maps. The tools offer possibilities for use in other projects such as common bird monitoring programmes.

THE NEW REAL-TIME VERSION OF THE EUROBIRDPORTAL VIEWER

Gabriel Gargallo, David Martí, Juan Arizaga, Stephen Baillie, Lluís Brotons, Brian Caffrey, Tomasz Chodkiewicz, Gaëtan Delaloye, Cristi Domsa, Frode Falkenberg, Ruud Foppen, Carlos Godinho, Marc Herremans, Philippe Jourde, Andres Kalamees, Nagy Károly, Ivan Katanović, Istvan Kovacs, Roberto Lardelli, Itri Levent Erkol, Patric Lorgé, Sam Marston, Blas Molina, Johan Nilsson, Anders Olsen, Jean-Yves Paquet, Yoav Perlman, Clara Pladevall, Georgi Popgeorgiev, Danae Portolou, Ilze Priedniece, Jozef Ridzoň, Hans Schmid, Norbert Teufelbauer, Gerard Troost, Peter Uppstu, Dylan Verheul, Zdeněk Vermouzek, Dani Villero, Johannes Wahl, Chris Wood

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Thanks to the work undertaken in the framework of the LIFE EBP project (2016-2018), the new version of the EuroBirdPortal - EBP (https://www.eurobirdportal.org) viewer is now depicting the spatio-temporal patterns of bird distribution of 105 bird species in near real-time. This unprecedented development has required the creation of a new central database repository and the implementation of an automated data flow system between the local online portals and the EBP central database. Now, the central database repository infrastructure, developed using PostgreSQL on an Amazon instance, collects all the data and automatically updates the tables used by the cloud data visualization platform CARTO so that the EBP viewer maps and graphs are kept updated on a weekly basis. Moreover, to facilitate the visualization of the most recent data a new functionality of the EBP viewer depicts animated maps based on the last 52 weeks of data. The automated data flow, on the other hand, uses a JSON schema to format the data provisions following the new EBP data standard and an API/web service to manage the data exchange flow automatically. Data provisions mostly take place on a daily or weekly basis and include new data and edits or deletions of the data submitted on previous occasions. The bulk of the data from the local online portals is received using this new automated data flow system. However, to ensure that this new version of the EBP viewer showed data from the whole partnership, for portals that were not connected automatically in the course of the LIFE project, mostly those that joined once the LIFE project started, a temporary manual or semiautomatic data flow solution was put in place. The overall relevance of these new developments and their implications for the future of the EBP project will be discussed.

USING CITIZEN SCIENCE TO ESTIMATE NUMBERS OF UK HOUSE MARTINS AND INVESTIGATE FACTORS AFFECTING PRODUCTUVITY

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There is evidence that the House Martin *Delichon urbicum* is declining in the UK, and across Europe. In the UK, the House Martin population is poorly monitored by traditional survey methods, though Bird Atlas 2007-11 detected strong geographical variations in changes in relative abundance between 1988-91 and 2008-11. There is therefore a need for a robust UK population estimate so that future changes in population size both regionally and nationally can be monitored, as well as a need to better understand potential regional variation in the species breeding ecology and coloniality. In 2015, we developed a citizen science project using a sample of 1 km squares allocated randomly within strata related to the habitat preferences of House Martins across the UK, with the aim of establishing a new population estimate. Volunteers were asked to make two visits, and these were timed so that visits would coincide best with the first breeding attempts of the season. In total, 2,934 one km squares were surveyed for House Martins across the UK, with 1,801 (61%) receiving two survey visits.

Although dependent on the modelling framework used, the House Martin population is provisionally estimated as ~691,000 breeding pairs. To complement this survey, in 2016 and 2017 we ran a Nest Study Survey to investigate factors affecting the breeding performance of House Martins in the UK. Volunteers were able to select any sites and were asked to record nesting activity once a week throughout the breeding season, and to record a range of parameters about the nest, location of the nest and adult activity. Uptake was good, with 4,779 and 4,510 nests monitored in 2016 and 2017 respectively. We looked at the effects of geographical location, building type, weather and habitat on 1) timing of breeding, 2) number of broods and 3) nest success.

A CITIZEN SCIENCE APROACH TO MONITOR WINTERING WOODCOCK

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The Woodcock *Scolopax rusticola* is an important game species that cannot be properly evaluated by common bird census techniques. It winters in or migrates through all Europe. Woodcock hunters from different countries, joined in the Federation of Western Palearctic Woodcock Associations (FANBPO), collect data on hunting activity that can be used to annually evaluate relative abundance and demographic parameters of the wintering population. We used generalized additive mixed models (GAMMs) to investigate the variation in the number of different woodcock seen per hunting trip, during and between hunting seasons in France, Spain and Portugal (Franco-Iberian region; 2006-2007 to 2017-2018) and Italy (2016-2017 to 2017-2018). For these countries and for Switzerland, Ireland and Wales we also analyzed demographic parameters (the ratios of female:male and juvenile:adult) from bagged birds.

The relative abundance varies along the hunting season (October to February). In the Franco-Iberian region the relative abundance remained stable during autumn migration and winter in the last twelve years. The sex ratio remained stable in the Swiss-Franco-Iberian and Swiss-Italian regions, but the former had a higher proportion of females. The age ratio varied between hunting seasons and regions. This research is an example of the effective use of data collected through citizen science, which aims to maintain a favorable conservation status of the Woodcock while allowing a rational use of its populations via sustainable and controlled hunting.

BIRD FEEDER ATTENDANCE DURING WINTER INVESTIGATE WITH A NEW AND ORIGINAL CITIZEN SCIENCES SCHEME BIRDLAB

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Supplementary feeding of birds during winter is a widespread phenomenon in temperate countries. Since 2014, the French MNHN started an ambitious citizen science scheme named BirdLab that aims to observe bird communities and understand the intra- and inter-specific interactions at feeders. We invite participants to reproduce bird movements (arrival, feeder switch, leaving in real time on two identical bird feeders) on their smartphone or tablet by drag-and-dropping small characters representing species, during 5 minutes exactly. Four seasons after, we collected more than 27,000 samples of 530,000 birds from 27 easily recognisable species among the most common species that used the birdfeeders in France. Very well standardised, these observations allowed us to study winter birds at the level of France. In particular, we examined how the effect of urbanised, agricultural, forests and semi-natural landscapes around feeders influence bird diversity and activity, and with the end of winter coming.

As expected, the diversity of species recruited to feeders increases with diversity of landscape composition and decreases with the proportion of urban area. Furthermore, we show a redistribution of farmland bird abundance during the second half of winter in landscape that can provide enough food available for birds. This result supports the hypothesis that BirdLab provides very standardized data that seem to be good indicators for ecological dynamics at the landscape scale. BirdLab has great potential to recruit beginners in birdwatching and to educate people to bird conservation.

BIRD ATLAS OF THE SOUTHWEST COAST OF PORTUGAL

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This atlas covered a 5 km wide strip of the southwestern coast of Portugal between Troia and Burgau. This area is very important for wildlife, especially birds. It comprises four Important Bird Areas and intersects one Nature Park and two Nature Reserves. This area has been under an enormous pressure from tourism and related construction of infrastructures and increase in human activities. The area was divided in 5x5 km squares which constituted the sampling unit for the atlas. Sampling occurred in three seasons: spring (breeding season), end of summer/autumn (post-breeding migration) and winter. During systematic surveys, each sampling square was visited for a minimum of four hours in each season, including line transects during the early morning, in which all birds observed or heard were recorded, and sampling directed at rare/less conspicuous species, counts of waterbirds, raptors and nocturnal birds.

We recorded 273 bird species within the study area. Around one third of these species are resident, while 30% are wintering birds and 15% are summer visitors. The remaining species are either regular passage migrants or species whose presence in the area is irregular. Six species are introduced exotics, of which three have naturalized populations. Four Iberian endemics were found. Most species have a Least Concern conservation status in Portugal. However, several of the species that were found have unfavorable conservation status: 12 are Critically Endangered, 13 are Endangered and 29 are Vulnerable. Considering global conservation status (IUCN), five species are considered globally threatened: Spanish Imperial Eagle *Aquila adalberti*, Rüppell's Vulture *Gyps rueppellii*, Egyptian Vulture *Neophron percnopterus*, Great Bustard *Otis tarda* and Balearic Shearwater *Puffinus mauretanicus*. The locations where most threatened species were found are coincident with the diversity hotspots: the lagoons between Melides and Sines, the Sado Estuary and the Sagres Peninsula.

THE RENATURATION PROJECT ON THE INTERMITTENT KARSTIC LAKE CERKNICA (CENTRAL SLOVENIA): THE ASSESSMENT OF ITS EFFECTS ON NATURA BIRD SPECIES

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Large renaturation works are planned within LIFE project Stržen (LIFE16 NAT/SI/000708) on Lake Cerknica (central Slovenia, also SPA with the same name), during which the watercourse Stržen will be extended by additional 1.5 km. This will be done by channelling it into its original waterbed. Along with activities from other projects this will help retain the water level in the lake for a longer period of time and create a suitable habitat for Natura 2000 species. The area belongs to the priority Natura 2000 habitat type Turloughs and has high diversity of birds and other species. One part of the assessment of the project's effects is the monitoring of the common bird species on the lake. In 2018 we did an extensive 36 km long transect count, together with the habitat survey.

The results showed different responses of the species to water level, both early and late in the breeding season. The ccaCCA plot and subsequent regression analysis with boosted regression trees, showed three groups of species; one group will profit with the longer retaining of water (for instance Western Water Rail *Rallus aquaticus* and Great Reed-warbler *Acrocephalus arundinaceus*), while bush and grassland specialists show negative response to any level of water at any time. The intermediate group, breeding mainly in areas with sedge (for instance Sedge Warbler *Acrocephalus schoenobaenus*, Reed Bunting *Emberiza schoeniclus*) tolerates lower levels of water and will also profit with the longer retaining of water, although at the borders of the flooded lake. Any future management of the lake will have to take into account these different responses of Natura 2000 and other bird species.

WATER-LEVEL MANAGEMENT IMPLICATIONS IN MAXIMIZING ARTIFICIAL PONDS STOPOVER POTENTIAL FOR THE BLACK STORK'S FALL PASSAGE

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Widely considered epitomic for the "umbrella species" concept, the Black Stork *Ciconia nigra* has mostly unknown population trends across Central Europe, being listed as Vulnerable Species in Romania. The usage of man-managed ponds as stopovers for the Black Stork's passages has increased lately, stressing the multiple services that such areas could deliver regarding long-term conservation of this species, if adequately managed. In central Romania, one of the most important fall passage stopovers for Black Stork's is Dumbrăvița Fishing Complex (Brașov County). This study aims to underline that site potential as fall passage foraging area for Black Stork's could be maximized through synchronizing drainage management with the species inherent migratory pattern on this route. Weekly monitoring of the Black Stork's evening foraging took place during 6 consecutive fall passages (August-September; 2013-2018).

Migratory peaks, when compared with bibliographical data (1995), show notable increase in recent years. Numbers amounting to the largest fall passage population for Transylvania (over 70 individuals), were consecutive to draining larger ponds during the Black Stork's migratory peak period for this route (20th August-10th September). Peak month transitioning for different seasons was consecutive to hydrological management decisions, while periods of drainage interruption prompted the lowest values for each seasonal dynamic. Pond focused analysis emphasizes that maximum migratory values correlate positively with passage-synchronized water discharge. When including in the analysis data regarding the fall passage peak values for another big wader exploiting this area as stopover - the Grey Heron *Ardea cinerea*, pond size and drainage succession presented enhanced importance in supporting Black Stork's significant passage populations at Dumbrăvița. Therefore, we propose synchronizing larger ponds drainage with the period of maximum passage intensity for the Black Stork's post-nuptial migration.

POPULATION MONITORING OF SOME ARDEIDS IN THE KIZILIRMAK DELTA, TURKEY

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All 9 species (Eurasian Bittern *Botaurus stellaris*, Common Little Bittern *Ixobrychus minutus*, Black-crowned Night-heron *Nycticorax nycticorax*, Squacco Heron *Ardeola ralloides*, Cattle Egret *Bubulcus ibis*, Little Egret *Egretta garzetta*, Great White Egret *Ardea alba*, Grey Heron *Ardea cinerea*, Purple Heron *Ardea purpurea*) of Ardeidae occurring in Turkey are breeding in the Kızılırmak Delta. The aim of the study was to understand the spatio-temporal changes of the Ardeids and to study the breeding biology of the tree nesting Ardeids in the delta. This study presents the phenology of all species for two years and the breeding aspects of colonial tree nesting Ardeids. Once every two week, birds were counted at 32 selected locations and transects, representing different habitat types. During the breeding season, 3 breeding colonies were monitored to observe and evaluate breeding parameters.

The peak counts for the species were made in the beginning of April and the beginning of July with a maximum count at one day of Little Egret 2568 individuals, Great White Egret (1232), Grey Heron (1480), Purple Heron (365), Black-crowned Night-heron (436), Squacco Heron (310) and, Cattle Egret (721), with a total of 7212 individuals. The highest numbers were recorded at wet meadows and rice fields. The earliest breeder among the migrators was Little Egret. The numbers of nests at three colonies were 1772, 950 and 416 with 527, 480 and 416 being occupied respectively. The breeding Ardeid population consisted of 68% Little Egret, 10% Black-crowned Night-heron, 10% Squacco Heron, 7% Cattle Egret and 4% Grey Heron. Fledging success was the highest for Black-crowned Night-heron (3.15 chick/nest) and the lowest for Grey Heron (1.55 chick/nest). As there has been no competition for foraging sites and breeding sites observed, it is concluded that the delta has sufficient resources for the Ardeids. This project has been funded by the Ondokuz Mayıs University Project Management Office with the Project Number PYO.ORN.1901.13.001

ORNITHOCOMPLEXES OF STEPPE AND FOREST-STEPPE TOBOLO-IRTYSH IN SUMMER AND WINTER PERIODS

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We collected data for characterize bird populations of Tobolo-Irtysh steppe and forest-steppe, forest-field, forest-meadow and meadow-field types. The tendency to increase the list of dominant species was noted in the period of seasonal migrations. The other leaders Paddyfield warbler (*Acrocephalus agricola*), Coot (*Fulica atra*) and Pochard (*Aythya ferina*) are confined to water bodies, and widespread synanthropic prevail in the residential part of the study area. Quite unexpectedly, due to the increased feeding behavior on solid waste landfills, the list of leaders is complemented by Yellow-legged Gull (*Larus cachinnans*). On water bodies and streams, the list of the prevailing species in the second half of summer includes Mallard (*Anas platyrhynchos*), Northern Pintails (*Anas acuta*), Tufted Duck (*Aythya fuligula*), and Avocet (*Recurvirostra avosetta*) and the Little Stint (*Calidris minuta*) on light-salted lakes. In steppic habitats the list complements with Common Kestrel (*Falco tinnunculus*). In winter, the list of leaders in the built-up part of the steppe and forest-steppe remains dominated by synanthropic species House Sparrow (*Passer domesticus*), Tree Sparrow (*Passer montanus*). Other changes in the summer list of dominant are manifested by the presence of tundra and taiga wintering species in it. In forested habitats it is Bullfinch (*Pyrrhula pyrrhula*). These species are found mainly in afforested and forest-stepped forest-steppe and meadow-field units. In open meadows, fields and steppes among the leaders are the Goldfinch (*Carduelis carduelis*), White-winged Lark (*Alauda leucoptera*), Snow Bunting (*Plectrophenax nivalis*), Snowy Owl (*Bubo scandiacus*) and Eurasian Jackdaw (*Corvus monedula*). At the same time, the anthropogenic transformation of steppe and forest-steppe landscapes unambiguously leads to an increase in the abundance of common and widespread bird species on the urban areas of Western Siberia.

THE AFRIBIRDS EXPERIENCE FOR UPSCALING COMMON BIRD MONITORING IN NIGERIA

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The lack of bird observations and consistent monitoring schemes in Africa creates a large information gap, for understanding the population trends of Afro-Palearctic migrant birds, for weighing the different factors of decline operating either on birds' wintering grounds, breeding grounds or on migration routes and, consequently, for identifying ways to reverse the decreasing trends. The NABU surveyed the UNESCO network of African Biosphere Reserves to reveal their current knowledge, equipment and practices on bird monitoring and to identify the constraints to be removed so that African organizations managing protected area can play a proactive role in bird conservation. As a nucleus for standardized replication and potential expansion, a long-term bird monitoring and conservation scheme was adapted and implemented in two selected pilot sites at the Omo Forest Reserve in Nigeria and the Comoé National park in Ivory Coast. Under this project called AfriBiRds, 5 BirdLife organizations are involved to give a particular focus on common bird, where data gap are even more explicit in Africa. Each pilot monitoring team and ecological monitoring officers from 14 guest African biosphere reserves were conveyed on site to follow a training workshop on bird monitoring. The results of the workshop are compiled into a monitoring toolkit delivering field recommendations for bird identification and monitoring equipment, guidelines to set a common bird monitoring scheme in African protected area and tutorials to use mobile apps and internet platform for recording, managing and archiving bird observations and recommendations. The preliminary results from the two first field campaigns will be also presented with the lessons to be learnt from the Nigerian and the Ivoirian experiences and to sound promising replication of this initiative. AfriBiRds aims finally to contribute to the emergence of an African Bird Census Council and an Afro Bird Portal in collaboration with Europe.

THE AFRIBIRDS EXPERIENCE FOR UPSCALING COMMON BIRD MONITORING IN IVORY COAST

Dibié Bernard Ahon, Wadja Mathieu Egnankou, Alex Ngari, Samuel Fournet

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LINKING BIRD DIVERSITY, LANDSCAPE DYNAMICS AND AGRICULTURAL POLICIES TO INFORM CONSERVATION ON FARMLAND

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Managing farmland for conservation is complex, as farmland bird diversity is constrained by a number of factors such as biophysical conditions, agricultural policies and socioeconomic drivers, which may affect the effectiveness of conservation actions. Here, we develop three case studies aiming to analyse spatiotemporal variation in bird diversity in relation to landscape dynamics, agricultural policies and conservation actions. Breeding birds were surveyed using a network of 78-transects distributed across high- and low-intensity open Mediterranean farmlands in southern Portugal, sampled annually before (1995-1997) and after (2010-2012) the Common Agricultural Policy (CAP) reform of 2003, and the implementation of conservation actions on the low-intensity farmland.

Results show that enhancing the effectiveness of conservation investment in farmland requires improving matching between conservation and agricultural policies. Also, results suggest that both farmland composition and heterogeneity should be considered when managing farmland landscapes for conservation, with special focus on composition where conservation targets are strongly associated with crop habitats. Finally, we show that the analysis of beta-diversity against specific conservation goals is required to understand the impacts of agricultural policies and conservation actions on farmland biodiversity, as it provides information on how changes in landscape heterogeneity affect alpha- and gamma-diversity. We discuss how conservation management should differ with farmland type, suggesting that management in open low-intensity farmland must be focused on protecting steppe birds, while because, in high-intensity farmland, existing habitats have reduced capacity to support specialized species of high conservation concern, and shifts from high- to low-intensity farming systems are difficult to occur, management should focus on increasing species richness. Contributions for the CAP reform post 2020 are also discussed, by emphasizing that conservation measures need to be specifically tailored to socioecological contexts and conservation targets, and that the old idea that "one size fits all" may not fit in some cases.

BREEDING BIRD ATLAS OF A NATURA2000 SITE – ENGURE NATURE PARK, LATVIA

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Bird presence and breeding proofs were registered in 1x1 km squares (n=170) in 1995-1999 and in 2016-2017. Species distribution between these two periods was compared (Chi^2 test).

In total, 144 species have been recorded in both periods 19 species only in 1995-1999, 8 species only in 2016-2017. 16 species show statistically significant increase in distribution which coincides with increasing trends registered by countrywide atlas and/or breeding bird counts. 34 species show statistically significant decrease in distribution, only 16 of them sharing trend with the national atlas. Of the 120 species without significant distribution change in Engure NATURA2000 some are too scarce to show significant trends, colonial birds do not change distribution yet, while numbers have changed drastically. Waders are still present thanks to habitat management activities. Global and local reasons for the observed changes are discussed.

ASSESSING THE LONG-TERM EFFECT OF NATURA 2000 NETWORK ON COMMON BREEDING BIRD COMMUNITIES

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The Natura 2000 network (N2000) is currently the largest coordinated network of protected areas in the world, and focuses on the conservation of most valuable and threatened species and habitats in Europe. So far, few studies have looked at the long-term effect of this protection network on biodiversity, and even fewer on common species. Here, using data from the French Breeding Bird Survey, we investigated the effect of N2000 on the temporal trends of non-threatened avian biodiversity in France, over the period 2002-2016. For this, we tested for differences in temporal changes in abundance and in community structure between sites inside or outside N2000. We considered abundance of i) the overall bird populations, ii) habitat specialists and iii) common species listed in the Annex I of the Bird Directive. Changes in community structure were measured through two functional indices: the Community Specialisation Index and the Community Trophic Index.

We found consistent results with previous findings pointing out at a significant decline of common bird populations over time. Our results show that this decline is weaker within N2000 areas than outside N2000, especially for farmland specialists. This emphasises that common bird species - not directly targeted by the protection network - may have benefited from the protection or management measures of N2000. However, we did not find any significant long-term protection or management effect of N2000 on bird communities. This lack of findings may reflect either a limited capacity of N2000 to deliver large benefits or the need for longer time series to detect protection or management effects at a community level. Overall our study supports the fact that Breeding Bird Survey is a useful tool to assess a protection network, and we encourage further studies to re-evaluate the impacts of the network in the coming future.

EXPLORING THE RELATIONSHIP BETWEEN ECOLOGICAL COMMUNITIES AND ECOSYSTEM SERVICES DIVERSITY IN EUROPE: ARE COMMON BIRD FUNCTIONAL TRAITS GOOD PROXIES?

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Links between biodiversity and ecosystem functioning are complex, and uncertainty remains about how results 'scale up' to whole landscapes and regions. Recently, effort has been focused on understanding trade-offs and synergies between ecosystem services and biodiversity. However, these trade-offs analyses still reduce biodiversity to species richness or other simplified indicators that do not completely cover the complex biodiversity concept. Here, we aim at (1) understanding the relationship between common bird communities and ecosystem services diversity in Europe (2) determining whether or not functional traits of species can be used as proxies for the different types of ES.

Relying on abundance data from the Pan-European bird and butterfly monitoring schemes, we develop a set of integrative multiple-species indicators for both taxa (*e.g.* community specialization index, community trophic index). We consider a set of 10 proxies for regulating, provisioning and cultural services. We then explore how these ES proxies are related to the community functional indices. Finally, we compare the values of these ecological indicators across the different types of ES bundles to reveal which bird community indicators are the best "predictors" of the ES bundles. Our main hypothesis predicts that regions with a healthy ecosystem state will be characterized by high species diversity and/or a balanced trophic community. Conversely, we expect that regions with degraded ecosystem states will harbor simplified bird communities.

THE STATE OF CINEREOUS VULTURE *AEGYPIUS MONACHUS* (LINNAEUS, 1766) IN ARMENIA

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The Cinereous Vulture *Aegypius monachus* in Armenia breeds only in Khosrov Forest State Reserve; its population makes from 11 to 13 breeding pairs and number of non breeding individuals is estimated as 3-7 per year. Population trend during last ten years demonstrates slight increase. The threats for the species are shortage of food supply, poisoning by heavy metals at municipal dumps, lead poisoning from the bullets, poisoning by non-steroidal anti-inflammatory drugs (NSAIDs) which come from livestock husbandry, and forest fires. The proposed conservation measures include: (1) review of the policy of punishments for poaching the species and strengthening inspection; (2) increase of network of the citizen scientists, who can advocate against poaching; (3) study of the potential poisoning of the species by heavy metals and NSAIDs; (4) development of sustainable artificial feeding stations; (5) strengthening capacity of Khosrov Reserve with fire early warning and fighting systems; (6) continuous monitoring of the species and reassessment of its conservation status in 2020.

DEPLOYING VOLUNTEER SEABIRD MONITORING FROM FERRIES, WITH STANDARDISED SURVEY METHODS

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Many citizen science schemes utilise ferries to collect time series data on marine mammals. However in the UK, none collect seabird data to the European Seabirds at Sea (ESAS) data standard, used in national monitoring schemes widely throughout Europe. In collaboration with CalMac ferries, JNCC have developed an ESAS standard, ferry-based citizen science scheme. Traditionally, ESAS data have been collected by professional observers, trained and assessed in survey and data recording methods. Training is expensive and time consuming, and passing the assessment perceived to be difficult, making this model inappropriate for a volunteer-based citizen science scheme. Other issues, such as observer suitability, data quality, and the burden of data entry on volunteers also needed to be addressed. As a solution, JNCC implemented a modified training scheme that utilised 'on survey' mentoring as well as a more focused, practical means of teaching the survey methods in the classroom. Formal assessment has been removed with 'pressure-free' practical training in its place. A pilot study showed that the modifications made training more effective in preparing volunteers for survey, and has helped remove the perception that ESAS surveys can only be carried out by extremely experienced professional observers. Data quality was well managed by mentors, and volunteers felt their skills were nurtured well under the guidance of a more experienced mentor. Introducing a bespoke data recording app to use in the field will help maintain data quality, and ensure that the burden of 'after survey effort' is removed from the volunteers. The work has demonstrated that citizen science schemes collecting high quality ESAS data can be developed. Projects like this could provide valuable additional data to national schemes monitoring seabirds at sea.

SEABIRDS COUNT: TAKING STOCK OF BRITAIN AND IRELAND'S SEABIRDS

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In 2015, the 4th breeding seabird census for Britain and Ireland, Seabirds Count, was launched by the Seabird Monitoring Programme (SMP) partnership. Its aim is to increase our understanding of how seabird numbers have changed, both temporally and spatially, in the last 15 years. Censuses give us the unique opportunity to investigate population change on both a temporal and spatial scale. During the last breeding seabird census for Britain and Ireland (Seabird 2000), 11 seabird species showed declines in their numbers compared to the previous census results.

Annual monitoring since then has suggested many seabird species are still showing population declines, along with decreased productivity. However, the story is somewhat inconsistent, both between species and between colonies. Each census provides its own challenges, like Seabird 2000, Seabirds Count will attempt to survey all known seabird breeding sites, both along the coast and in land. Meaning over 10,000 sites will be surveyed, and the role citizen science will play in this project will be much larger than previous censuses. Unlike its predecessors, Seabirds Count, will also aim to implement a systematic method of surveying urban nesting gulls and from this produce population estimates. The surveys for which will mostly be conducted by volunteers. By achieving a full census, we can maintain, and add to, a long-term dataset, which in the past has been instrumental in research looking at the effects of a variety of pressures acting on seabirds around the UK. It will additionally provide comprehensive baseline data, in a time when marine industry is increasing, and its impacts are still relatively unknown.

ON THE STATUS OF COMMON POCHARD IN SOUTH-WESTERN SIBERIA

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We collected data on Common Pochard *Aythya ferina* numbers during 2015-2018 in four areas selected for waterfowl surveys in Kurgan (2015), Tyumen (2016), Novosibirsk (2017) and Omsk (2018) administrative regions of Russia. Counts were conducted in post-breeding (late August) and migration (mid-October) seasons. Additionally we used data on species composition in the hunting bag collected during photographic survey at the scale of administrative regions.

Among all duck species counted in August, Common Pochard numbers presented 62.3% in Kurgan, 18.8% in Tyumen, 50.3% in Novosibirsk, and 92.5% in Omsk regions. Mean numbers ranged from 213 (Tyumen) to 18,297 (Novosibirsk) individuals counted per one day. Common Pochard was the most abundant species of the ducks at all areas surveyed. In October the proportions of Common Pochard were 22.5%, 0%, 15% and 41.6% respectively. In the mean we counted from 0 (Tyumen) to 574 (Novosibirsk) Common Pochards per day. Common Pochard remained the most numerous duck species at the area in Omsk Region, whereas followed the Common Goldeneye *Bucephala clangula* in Kurgan, the Mallard *Anas platyrhynchos* and Common Goldeneye in Novosibirsk regions, and was missing in Tyumen Region. In autumn hunting bags of ducks the Common Pochard was 8.3% in Kurgan, 16.4% in Tyumen, and 38.8% in Novosibirsk regions. It followed the Common Teal *Anas crecca*, Gadwall *Mareca strepera* and Common Goldeneye in Kurgan, and the Mallard in Tyumen regions, while was the most bagged duck species in Novosibirsk Region. Data from Omsk Region is still under preparation. Therefore, Common Pochard can be evaluated as common and abundant species in south-western Siberia.

CIS-CAUCASIA STEPPES AS AREA OF THE SECONDARY CONTACT ZONE OF TWO SPECIES OF NIGHTINGALES

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Cis-Caucasia steppes of Southern Russia were actively afforested throughout the 20th century. The result of such a deep anthropogenic chance of steppes has become the emergences of a unique zone within the conditions contribute to resettlement of different taxa of birds towards each other from the European deciduous forest and the Caucasus forests to the north and south respectively. Our study focuses on the abundance, distribution and interaction between two closely related species of nightingales, the Common Nightingale *Luscinia megarhynchos* and the Thrush Nightingale *L. luscinia* in Cis-Caucasia steppes of Southern Russia. These species have subsequently come into secondary contact in Central and Eastern Europe and Cis-Caucasia steppes. Interspecific hybridization has proven for mixed population of nightingales in Europe. Analysed data were gathered during May and June 2017 in Cis-Caucasia steppes. Within each population ecologically important traits were measured in each male and a blood sample was collected for genetic analysis. The zone of secondary contact of nightingales in Cis-Caucasia steppes was located in the north-eastern part of the Krasnodar region and in the western part of Republic of Kalmykia according to study of this region conducted 30 years ago.

At present, mixed populations have been found only in the Kalmykia. Several individuals were identified by morphological characters as interspecies hybrids, so we assume hybridization in this population. In the investigated areas of Krasnodar region, the Common Nightingale was not found, although it was erstwhile common in these areas. The number of the Thrush nightingales, on the contrary, has increased and the obtained date shows the further spreading the species to the south. These results characterize Cis-Caucasia zone of repeated contact of the Thrush and the Common nightingales as a sufficiently dynamic area, the reason of which is probably the fact that the origin is relatively young and anthropogenic.

POPULATION DECREASING OF SAKER FALCON (*FALCO CHERRUG*) IN REPUBLIC OF MOLDOVA

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During its entire evolution, mankind changed the nature according to its own necessities, forcing the wildlife to adapt or to disappear. In some regions, the human pressure is higher than in others, but this is not necessarily related to the population size, but more likely to the economic development. This principle is also available for Eastern Europe, where due to a low economic level population was unable to reach higher levels of industrialization, thus ensuring a richer biodiversity. The study area covers the territory of the Republic of Moldova, which is situated between the Prut and Dniester Rivers (33,843 km^2) and has approximately 3 millions inhabitants. The landscape is represented by hilly areas and relatively low plains. The use of land is mostly agricultural with fragmented parcels, resulting in a mosaic of artificial and natural habitats. The human pressure has started in the middle of the XXth century, when massive areas/surfaces of natural land were transformed in farmlands. After the collapse of the Soviet Union, big agricultural lands started to be fragmented, turning into highly split plots (sau parcels) intercalated with unused agricultural fields. Forests were also fragmented and still continue to be, with few larger bodies being present today in the central parts of the studied territory. Most of the pastures in this area are grazed by domestic animals. Being a distinctive species, the Saker Falcon *Falco cherrug* was highly affected by intensification and change of land use, and human actitivity. In the beginig of the XXth century the Saker Falcon was at that time a common bird in Moldova. Unfortunately, there is no estimation of the breeding population, not even for middle of XXth century. Further research (1960) had shown that there were 10 pairs of Saker Falcon present in a forested area of 84.5 km^2 only. In 2010 the population was estimated at 5-10 pairs, while in 2015 were found three nests, out of which only one had fledglings. The breeding range had rapidly changed too in a relatively short period of time. Changes occurred in the breeding ecology as well, because the species switched from trees and sometimes cliffs (1960) to electrical poles (High Voltage Line) only, being concentrated nowadays mainly in the southern part of the country.

COMMON QUAIL SEASONAL MIGRATIONS AND GLOBAL CLIMATE CHANGES

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There are some differences in term of going of definite stages of biological phenomena in some countries in connection with global climate changes. Even the forecast was made how the distribution of breeding birds in Europe will be after 100 years. So, logically the question arises: are there any tendencies in the terms of Common Quail *Coturnix coturnix* migration in Ukraine? On the base of own data collected during 40 years (1975-2015) and literature we tried to answer the question. All phenological data were divided in two periods 20 years each for comparison. As a result we got 4 excerpts – two for spring two for autumn migrations. As a result of the analysis we got the following: the early arrival is observed in 4 regions of Ukraine (Chernigiv, Vinnytsya, Poltava and Zaporizhzhya) and in 5 regions (Khelnyts'k, Dnipropetrivs'k, Odesa, Kharkiv and Lviv) it started to arrive later. According to our studies the Common Quail started to depart considerably early in 6 regions (Kyiv, Zaporizhzhya, Dnipropetrovs'k, Kirovograd, Poltava and Cherkasy) and on the contrary later in 10 regions (Volyn', Zhytomyr, Sumy, Ternopil', Crimea, Donets'k, Lugans'k, Mykolaiv, Odesa and Kharkiv). So our studies showed that during the last 40 years the terms of Common Quail migration have been changed in different ways in different regions. Why so? Because climate change mean a redistribution of temperature and humidity among different regions.

LATE AUTUMN GATHERINGS OF WATERFOWL ON SOUTHERN PART OF THE KYIV RESERVOIR (NORTHERN UKRAINE)

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The Kyiv reservoir plays important role for seasonal bird movements. While the diurnal birds of prey, pigeons, passerines and some others migrate along the water body's banks, the waterfowls migrate mostly during the night and in a daytime they rest on a water surface forming the gatherings of many species. The counts of such gatherings allow indicating their species abandons numbers and terms of migration of definite species. Our counts were conducted during the middle of October until the beginning of December in 2013-2018. Therefore, the counts were focused on late autumn gatherings, which differ from early autumn ones by species composition, especially ducks, and their numbers.

During the counts, 13,573 birds of 36 waterfowls were recorded. Mallard *Anas platyrhynchos* was absolute dominant reaching 50.64%; Common Goldeneye *Bucephala clangula* was on the second place (19.75%). The other ducks (10 species) reached 1.91% of total number of birds. Gulls were presented by five species (11.9%). Among them two rare species were recorded (Pallas's Gull *Larus ichthyaetus*, Herring Gull *L. argentatus*). Black-headed Gull *L. ridibundus* and Caspian Gull *L. cachinnans* were dominant gull species (5.35%, 2.67%) and only 2.11% of gulls were difficult to identify as species. Swans *Cygnus olor*, *C. Cygnus*, *C. bewickii* (87 birds) and *C. atratus* (2 birds) accounted for 5.76% of total numbers. Other species recorded were Great Crested Greabe *Podiceps cristatus* (4.22%) and Great Cormorant *Phalacrocorax carbo* (4.77%). During the counts, some individuals of rare species were recorded as well (Read-throated Loon *Gavia stellata*, Horned Grebe *Podiceps auritus*, Red-necked Grebe *P. grisegena*, Long-tailed Duck *Clangula hyemalis*, Velvet Scoter *Melanitta fusca* and Common Scoter *M. nigra*).

EUROPEAN RAPTOR BIOMONITORING FACILITY (ERBFACILITY*) – PREVENTING AND LIMITING NEGATIVE IMPACTS OF CHEMICALS ON HUMAN HEALTH AND THE ENVIRONMENT

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Environmental contaminants impose very high costs on human and wildlife health. Better knowledge on real-world bioaccumulation of contaminants can significantly reduce these costs by addressing three needs: (1) enhancing evaluation of the effectiveness of regulation; (2) enhancing reliable risk assessment of chemicals; (3) providing early warning of emerging contaminant problems. Raptors are particularly suitable for monitoring persistent, bio-accumulative and toxic substances because they are widespread, typically long-lived apex predators, which integrate contaminant exposure over time, over large areas and across a range of specialist and generalist food chains, are particularly sensitive to environmental contaminants and among the first organisms to exhibit readily observable responses.

The European Raptor Biomonitoring Facility (ERBFacility) is an open network of researchers and practitioners working towards coordinated Europe-wide monitoring of contaminants in raptors with a view to supporting the implementation of EU chemicals regulations and thereby reducing chemical risks to raptors themselves, to the wider environment and to human health. ERBFacility involves researchers working with analytical laboratories ("Analysis Arena"), curators of raptor collections in museums, specimen banks and research institutions ("Collections Arena"), and field workers involved in raptor monitoring and conservation ("Field Arena").

ERBFacility aims to underpin next generation biomonitoring in Europe by delivering: complementary frameworks for a European Raptor Biomonitoring Scheme, a distributed European Raptor Specimen Bank and a European Raptor Sampling Programme (ERSamP); a meta database of samples; harmonised standards and protocols for analyses and sampling; best practice guidance for sampling; proof of concept for Pan-European assessments and harmonised sampling.

Regarding the "Field Arena", we are developing a framework, standards and protocols for a ERSamP, and building capacity through networking and collaboration among field ornithologists, raptor collections and ecotoxicologists. This includes reviewing key constraints to collecting samples and contextual data; developing best practice guidance and protocols; and analysing raptor ringing effort.

*ERBFacility Network is represented in Bird Numbers 2019 by Rui Lourenço.

HOW 10 YEARS OF RAM CENSUS HELP US UNDERSTAND SEABIRD POPULATION TRENDS IN PORTUGAL

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The Iberian Sea Watching Network (RAM) was implemented in Portugal in 2008 and since then has been used to gather important data about seabirds that use our coastal waters, either as a permanent residence, a passageway during their migrations, breeding site or has a wintering ground. RAM methodology is standard, guaranteeing data consistency and allowing for comparisons to be made across the sampled years. Observers (experts and volunteers) placed throughout the coastline, scan the sea from the horizon to the shore, identifying and counting the number of individuals per species. The direction of flight and behaviour (*e.g.* feeding, circling fishing boats, etc.) is also registered, later providing important understanding into target species phenology and distribution. The RAM census reports have been especially focused on nine target-species: Common Scoter *Melanitta nigra*, Cory's Shearwater *Calonectris borealis*, Balearic Shearwater *Puffinus mauretanicus*, Northern Gannet *Morus bassanus*, European Shag *Phalacrocorax aristotelis*, Great Skua *Catharacta skua*, Mediterranean Gull *Larus melanocephalus*, Sandwich Tern *Thalasseus sandvicensis*, and Razorbill *Alca torda*. These species are the most frequent ones and assure the study of resident, migratory, breeders and wintering birds. By collecting data during the last 10 years, we can now analyse passage rates, behaviour and population trends of these species.

Results of RAM data analysis have already given interesting results, such as the increase of passage rate for the most endangered seabird in Europe, the Balearic Shearwater, and the presence of birds all year round; expose large discrepancies between historical and present records of Mediterranean Gull, indicating a population decrease; and a significant increase in Razorbill passage rate. Therefore, RAM census has been a successfully monitoring tool in Portugal, expanding our knowledge in seabird distribution, population trends and actively involving citizens in marine conservation actions.

TRENDS AND INDICATORS OF ANDORRAN BIRDS

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As many other countries, Andorra has its Common Bird Monitoring Scheme. In this study we analyze the trends of 79 common birds and present 3 national indicators: the farmland bird indicator, the forest bird indicator and the alpine bird indicator for Andorra, analyzed in rTRIM. Andorran Bird Monitoring Scheme is so slight in terms of years (since 2011) and number of transects (20) that the trends of most of its species are not significant yet. We explain in this study which are those species who show some interesting trends and which reasons could explain it. On the other hand, we present 3 Andorran bird indicators, with a special look into alpine areas as one of the most representative habitat in Andorra, in a region (the Pyrenees) that belongs to the mountain area in Europe where mountain birds have declined more.

DISTRIBUTION AND EXPANSION OF THE GOOSANDER *MERGUS MERGANSER* IN SWITZERLAND

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The breeding area of the Goosander *Mergus merganser* in Europe stretches broadly from Iceland to northern Russia, with smaller populations in the centre of the continent and in the Balkans. A relatively isolated population occupies the foothills of the Alps, from France to Slovenia. This alpine population was estimated to 1000–1400 pairs in 1998. In Switzerland, Lake Geneva (Léman) has played an important role as a stronghold, from which the Goosander population started to spread towards the north-east. Population size increased from 490–670 pairs in 1998 to 600–800 in the survey period of the Swiss Breeding Bird Atlas 2013–2016. However, the data collected during this atlas period showed spatially different tendencies, with a decline in the western historical bastion and an increase in the north-eastern part of the country, in Germany as well as south of the Alps. The colonisation of the lakes and rivers in southern Switzerland, also noticed in adjacent regions of Italy, is particularly remarkable. The exact reasons for local declines are yet to be investigated.

LAND USE CHANGE REDUCES COMMUNITY ADJUSTMENT TO CLIMATE WARMING OF WINTERING WATERBIRDS

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While the impacts of climate or land use changes on biodiversity have been largely documented, their joined effects remain poorly understood. We evaluated how wintering waterbird communities adjust to climate warming along a gradient of land use change. Using mid-winter waterbird counts (132 species) at 164 major sites in 22 Mediterranean countries, we assessed changes in species composition, regarding thermal niche position and breath, over 1991-2010, in response to regional and local winter temperature anomalies and to natural habitat conversion. We showed that in response to temperature increase, communities get relatively richer in warm-dwelling specialist species and poorer in cold-dwelling species, but this adjustment to climate warming was strongly limited by natural habitat conversion. When natural habitat conversion increased, the increasing species were those with broader niche, independently to their thermal affinities. The strong negative impact of natural habitat conversion on community adjustment to temperature increase suggests an antagonistic interaction between climate and land use change. These results underline the importance of habitat conservation to mitigate the impact of global warming on biodiversity.

MODELING THE DISTRIBUTION OF MEADOW WADERS IN RIVER VALLEYS OF UKRAINIAN POLISSIA

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During 2012-2018 we studied numbers and distribution of Lapwing *Vanellus vanellus*, Redshank *Tringa totanus* and Black-tailed Godwit *Limosa limosa* on the territory of Ukrainian Polissia. The western part of this nature zone was covered relatively well, but central and eastern parts are still poorly surveyed. To understand the actual distribution of mentioned species in the whole region we applied the SDM approach. The main task on this stage is to select the optimal set of environmental predictors and model parameters. The analysis is based on data collected during two expeditions – 16-22 May 2017 and 20-24 May 2018. Almost whole length of the Prypiat' river valley and its main tributaries within Pollisia region were surveyed. All detected breeding pairs of waders were mapped with a GPS device. The distribution modeling was performed in Maxent 3.4.1. 25% of randomly selected breeding locations were used as a testing sample for ROC analysis. All environmental layers were prepared with a spatial resolution equal to 250m/pixel. In total 27 predictor layers were used for modeling: forest and shrub cover, arable lands, water bodies, urban areas, SRTM elevation data, distance layers from rivers and settlements, and 9 standard spectral indices. The indices were calculated based on cloud-free Landsat 8 OLI scenes (level-2 data products) taken between 26 May and 18 June in 2014-2015. AUC of final models indicated good performance: Lapwing – 0.837. Redshank – 0.890, Black-tailed Godwit – 0.983. Top 5 predictors in respect of their contribution to models (jackknife results) were: forest cover, elevation, area of arable lands, shrubs cover and NDVI. The total contribution of those 5 predictors ranges between 88 and 92 % in studied species.

EXPLORING TEMPORAL CHANGES IN AVIAN COMMUNITY COMPOSITION: DIFFERENCES BETWEEN FARMLAND AND FOREST HABITATS

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The aim of this study is to assess temporal changes in species composition of avian communities, and compare these changes among different types of environments in the Czech Republic. The main objectives of this study are to (1) quantify bird community's changes over an interval of 10 years in the surveyed sites by using dissimilarity indices and (2) analyse the effects of land use composition on the changes in avian diversity. Ornithologists from the Czech Society for Ornithology surveyed the sites in 2005/2006 and repeated the survey in the same sampling sites in 2015/2016. The first step in achieving the aims is to analyse dominant land use in the surveyed sites by using ArcGIS and national or regional land use maps. For the estimation of the dominant environment, three main landscapes types were taken into account, based on the land use composition: farmland, forest and mixed land landscapes. The second step is calculating different dissimilarity indices for assessing temporal changes in bird species assemblages for the 10-year period. Our findings showed that bird communities changed more in the last ten years in farmlands than in more natural habitat, with the lowest dissimilarity values calculated in forests. These results are confirming our hypothesis that areas subject to greater land use change (*e.g.* farmlands) represent a challenge for avian communities, which show higher temporal dissimilarities. This study provides new evidence on the effects of land use transformation on the current state of avian diversity.

A REVIEW OF COMMON POCHARDS (*AYTHYA FERINA*) BREEDING DISTRIBUTION CHANGES IN LATVIA (1958-2018)

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The assessment for the European Red List of Birds 2015 has indicated that in the last 20 years there have been serious reductions in the distribution and abundance of breeding Common Pochard *Aythya ferina*, resulting in the European population being upgraded from IUCN Least Concern status to Vulnerable. We created a review of the Common Pochard distribution changes in Latvia by using data from two long-term breeding duck surveys – one in Lake Engure (1958–2018), and another in Lake Kaņieris (2005–2018) – as well as including breeding bird atlas data of four periods: 1980–1984; 1985–1989; 2000–2004 and 2013–2017. In Lake Engure during the 1964–1979 ≈1300 breeding pairs of Common Pochard were estimated, but the current estimate in 2015 – 2017 is only about 100 pairs. The main cause of the decline is a combination of habitat loss and decrease of Black-headed Gull *Larus ridibundus* population at the Lake Engure, as well as increase in predatory pressure (increase of American Mink *Mustela vison* population). In Lake Kaņieris the Common Pochard has shown a stable population of about 150 pairs. The atlas data show a moderate distribution decline in the last 17 years.

THE ANDALUSIAN WILDLIFE MONITORING SCHEME: A LONG-TERM ASSESSMENT OF THE CONSERVATION STATUS OF BIRDS SPECIES

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The government of Andalusia (S Spain) has improved since >15 years ago the Andalusian Wildlife Monitoring Scheme (AWMS), which is a good example of how region wide monitoring programmes for birds species could be developed. The AWMS was designed to be maintained in the long-term including the monitoring of waterbirds, farmland and forest birds and cliff raptors. Through an intensive field work the biological parameters for each species are periodically monitored: census of breeding pairs and wintering birds, breeding parameters, non-adult/adult ratio for territorial and wintering birds, etc. Changes in the environmental conditions simultaneously are also registered to know how human pressure and management actions influence on populations. On the basis of this long-term monitoring program, conservation indicators' network has been designed aimed to easily, rapidly and accurately show the conservation status of the target species: (1) population trend indicators to know if populations are below of the "target" population level (the most realistic population among the desirable ones, defined from historical and/or current carrying capacity data) as point of reference for managers; (2) predictive indicators to inform of problems before the population numbers effectively declining, working as early warning signals; (3) management indicators, to probe if the implemented management actions have been useful to recover populations.

As main results, we highlight the positive trends of the populations of raptors (like Golden and Bonelli´s Eagles *Aquila chrysaetos* and *A. fasciata* or Griffon Vulture *Gyps fulvus*) and forest birds (*e.g.* Black Stork *Ciconia nigra*) and the strong decline of farmland birds from the last five years, especially Little Bustard *Tetrax tetrax*, Black-Bellied Sandgrouse *Pterocles orientalis*, Lesser Kestrel *Falco naumanni* or Dupont's Lark *Chersophilus duponti*, due to agricultural intensification. Among waterbirds, species that rely on freshwater wetlands such as coots and ducks are declining, while those linked to artificial wetlands are increasing.

THE AREA CHANGES OF SOME WETLAND BIRDS IN UKRAINE DURING THE LAST DECADES

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Crucial changes in wetland breeding birds have been happened in Ukraine during the last times. For instance, the tendency of numbers increasing and dispersing on the inland regions appeared among some wetland species of Azov-Black Sea area. Sometimes we can consider this phenomenon as a cycle fluctuation of their areas, but more often the species which dispersed themselves form in new locations stable and numerous communities which can displace the previously established species. Species that are increasing their numbers and now widely distributed on great part of Ukraine are: Great Cormorant *Phalacrocorax carbo*, Great White Egret *Ardea alba*, Mute Swan *Cygnus olor*, Caspian Gull *Larus cachinnans*, Whiskered Tern *Chlidonias hybrida*, Bearded Reedling *Panurus biarmicus*. Another group of birds includes non-abundant species which occur on breeding periodically beyond their nesting area but even in spite of successful reproduction on those locations their dispersion area continues to be limited. Even in that cases where they appeared by chance far from the sea coast regions, sometimes the conditions happened to be successful and birds can nest there during several years. This includes wetland species as Squacco Heron *Ardeola ralloides*, Little Egret *Egretta garzetta*, Eurasian Spoonbill *Platalea leucorodia*, Ruddy Shelduck *Tadorna ferruginea*, Common Shelduck *Tadorna tadorna*, Red-crested Pochard *Netta rufina*, Black-winged Stilt *Himantopus himantopus*, Pied Avocet *Recurvirostra avosetta*, Pallas's Gull *Larus ichthyaetus*, Little Tern *Sternula albifrons*, Paddyfield Warbler *Acrocephalus agricola*. Among different reasons for these changes the crucial role belongs to human activities obviously (establishing large reservoirs, fishponds etc.) and global climate changes as well.

DEVELOPMENT OF THE DANISH BIRD FAUNA OVER THE PAST 100 YEARS

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The aim of this poster is to give an overview of the development of the Danish breeding bird population by comparing monitoring data from the Danish Atlas projects from 1971-74, 1993-96 and 2014-2017 and the Danish Point Count Census since 1975 with the descriptions by Skovgaard 1932, a compilation of all data on Danish breeding birds' distribution from the 19th century till 1932. Studies found an increase in the number of breeding bird species, in all as well as per 5x5 km atlas square, especially among pursued species such as Northern Raven *Corvus corax*, Great Cormorant *Phalacrocorax carbo* and various birds of prey. Northern Raven has increased its distribution by 8 times and its breeding population by 15 times, and the Great Cormorant has increased by 30 times in both distribution and breeding population. Contrarily, species related to open habitats have decreased in population since the 19th century, *e.g.* Crested Lark *Galerida cristata* has now become the rarest breeding bird in Denmark with only one pair located in the northern part of Jutland. It is indicated that the population increases are a result of increased protection, more trees in open land habitats, the expansion of the Danish forests and overgrowing of wetlands. The decline in open land species is seen as a result of reduction of their habitats.

POPULATION TRENDS OF WATERBIRD SPECIES IN ANZALI WETLAND COMPLEX, SOUTHERN CASPIAN SEA REGION, I.R. IRAN

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The Anzali Wetland Complex is an internationally important wetland in the south-west Caspian Sea region, composed of several Protected Areas and Wildlife Refuges, essential for protection of a wide variety of wintering water birds. This study presents the findings of waterbird population's diversity and sizes in the Anzali Wetland Complex based on International Water bird Census (IWC) and the National Iranian Department of Environment census program data from 1988 to 2017. Long-term changes in the population of wintering waterbirds were analyzed using the RTRIM package v2.0.6 in R software ver. 3.5.2.

The mean number of water birds population were calculated at 83.568±7411 (n=30; 3,628–182,187 individuals) for a total of 99 species. The mean number of species were 40.1±2.03 (n=30; 12 species in 2008 to 58 species in 1997 and 2016). The most abundant species were Common Teal *Anas crecca*, Common Coot *Fulica atra* and Gadwall *Mareca strepera*, respectively. The results of the RTRIM analysis showed moderate increase of waterbirds population in long-term trend (1988-2017: 2.5%/yr, 1.0245±0.0001) and strong increase in short–term trend (2008-2017: 14.1%/yr, 1.1406±0.0008). Overall trend of the percentage of changes is 72.138.347±0.9, $p<0.01$ and percentage of changes of the last years is 77.455 ± 0.854, $p<0.01$. There is an evidence of changing in species composition at the site during study period, with increasing the populations of Pygmy Cormorant *Microcarbo pygmaeus*, Great Cormorant *Phalacrocorax carbo*, Gadwall and Common Teal, and decreasing of Northern Shoveler *Spatula clypeata* and diving ducks such as Common Pochard *Aythya ferina* compared to 1980s and 1990s. This is undoubtedly due to the site water level fluctuations caused by the rise or fall in water level of the Caspian Sea. The majority of waterbirds have been concentrated to the well protected parts of the site such as Selkeh Wildlife Refuge and Siahkesheem Marsh to avoid hunting pressure and habitat disturbances. Despite of relatively permanent threats to Anzali wetland in recent decades, population of waterbirds is always in fluctuation and growth. Essentially, the impact of the conservation activities and management should be evaluated on a regular basis.

LONG-TERM CHANGES IN NUMBERS OF COMMON POCHARD IN THE SOUTHERN CASPIAN SEA REGION, I.R. IRAN

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The Common Pochard *Aythya ferina* is a medium-sized diving duck with an extremely large population, estimated to be around 460,000-500,000 individuals in Western Siberia/South-west Asia flyway. Based on the International Waterbirds Census (IWC), the species count totals were around 55,000-193,000 individuals between 2011- 2015. This study implies on the results of the trend analyses of Common Pochard wintering population in the Southern Caspian Sea Region (SCS Region) based on IWC and the Iranian Department of Environment National Census program data from 1968 to 2017. Accordingly, long-term changes in the species wintering population were obtained using RTRIM software.

The maximum wintering population (107,923) was recorded in 2004, while the minimum (1,032) in 1987. In total, the species was counted at 85 different sites of SCS Region during the study period among which 3 sites of Gorgan Bay, Miankaleh Wildlife Refuge and Anzali Wetland Complex have supported the most portion of Common Pochard population. The results of the RTRIM assessment indicated moderate decline for both the long-term and short-term trends (1968-2017: -4.3 %/yr, 0.957 ± 0.0003; 2008-2017: -2.9 %/yr, 0.9709 ± 0.0042). The findings of this study matches with the fact that the SCS Region has a severe impact on the trends of the species population of Western Siberia/South-west Asia flyway as well as uplisting of the species to vulnerable category of IUCN Redlist. In order to improve and promote conservation status of Common Pochard in the study area and throughout the country, development of National conservation and management Action Plan for the species by the Department of Environment will be efficient.

RESULTS OF COMMON BIRD MONITORING IN ROMANIA BETWEEN 2006-2017

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The Common Bird Monitoring scheme started in 2006 in Romania. It uses the point-count method to assess population changes of widespread and common bird species. Monitoring plot selection is based on a semi-random procedure: volunteers are asked to indicate an area of approximately 10x10 km around their home from which a 2x2 km square is randomly selected. The survey is carried out twice per season and comprises 10 counting points. Birds are recorded in four distance categories in and around a 100-meter circle. At each point observations are conducted for 5min. The distribution of monitoring squares surveyed every year is still biased, concentrating on the central, north-western and north-eastern part of the country. The mountain habitats, high altitude forests and the large open areas are also underrepresented. Therefore, the trends for some species should be interpreted with caution. The number of observers remained constant with a median of 50. The median of monitoring squares was 60. Population trends are calculated for 75 species, but 42 of them is in uncertain category. Six species show a moderate decline, 12 are stable, 14 with moderate and one with strong increase.

ROMANIAN BREEDING BIRD ATLAS –METHODOLOGY AND RESULTS

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Romania Breeding Bird Atlas is a joint project of the "Milvus Group" Association for the protection of Birds and nature and the Romanian Ornithological Society/Birdlife Romania. It covers a period of 12 years (2006-2017) and will be published in 2019. In order to enhance the data from the period 2006-2015 an Atlas Method, resembling the one used for EBBA2, has been implemented in 2016-2017. The sampling for this method has been developed to fill the gaps by taking into account the distribution of the data from the monitoring schemes in order to obtain national representativityeness of the distribution of data. During 2016-2017 the scheme has been implemented in 300 10x10 km squares. Dedicated expeditions were also made in 2017 in order to reveal the distribution of some data deficient species (Sombre Tit *Poecile lugubris*, Cirl Bunting *Emberiza cirlus*, Semi-collared Flycatcher *Ficedula semitorquata*, Common Rosefinch *Carpodacus erythrinus*, Boreal Owl *Aegolius funereus*, Western Capercaillie *Tetrao urogallus*) in certain regions of Romania, or to clarify the distribution of species pairs, which are easily confused by observers (Thrush Nightingale *Luscinia luscinia* vs. Common Nightingale *Luscinia megarhynchos* and Eurasian Treecreeper *Certhia familiaris* vs. Short-toed Treecreeper *Certhia brachydactyla*). All the available data have been validated automatically or manually via an online database. For every species, an occurrence-based distribution map has been made, and, when possible, the presence and/or abundance of species were modeled using ecological niche models.

In the period covered by the atlas work (2006 - 2017), 251 species were recorded as breeders, including first proved breeding record for four species for Romania (Mew Gull *Larus canus*, Pallas's Gull *Larus ichthyaetus*, Pallid Swift *Apus pallidus* and Semi-collared Flycatcher). For Romania, the present atlas is notable, because every breeding claim is traceable, based on an open-source database or bibliographical records and it also is the first national attempt at using modelling techniques to refine species distributions and assess relative abundances.

A WINTERING FARMLAND BIRD INDEX BASED ON ROAD TRANSECT COUNTS

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Populations of farmland birds are facing strong declines in the past decades due to intensification of farming practices and dramatic changes of rural areas all over Europe. Breeding populations of farmland birds are being monitored in Portugal and elsewhere in schemes included in the PECBMS, but few countries have schemes to monitor wintering farmland birds. In Portugal we have CANAN (Christmas and New Year Bird Counts in Portuguese), a scheme for monitoring wintering farmland birds in the mainland, in place since 2000. The objective of this work is to compute an index of abundance of wintering farmland birds based in CANAN's database. Under CANAN's, volunteers were asked to perform road transects in farmland or grassland areas, during December and January. From 2005 to 2018 a total of 509 road transects were performed in 119 different sites, covering a total of 7,945.8 km (average 567.6 km per winter). Specific trends were calculated using the chain method to calculate an index based on road transects surveyed in consecutive years. We started with the year 2005, giving to these specific indexes the starting value of 100%. A composed index was computed based on arithmetic mean of individual trends for 18 species. This Winter Farmland Bird Index (WFBI) seems to be rather stable, with two or three winters with higher bird abundance alternating with one or two with fewer birds. The index is strongly correlated with only two species, Red Kite *Milvus milvus* and Lapwing *Vanellus vanellus*, but these are not driving the index. This set of species includes different phenologies and population trends, namely species that are mainly winter visitors and other that are residents, and species increasing and other facing strong declines. This index seems to represent well this group of species using Portuguese farmland during winter.

WINTERING BIRDS OF PREY MONITORING PROGRAMME IN ROMANIA

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In 2006 the Milvus Group Association initiated a long term citizen science programme with the aim of monitoring wintering populations of birds of prey in Romania. Observers are required to perform observations annually, twice per winter (December and February) on routes of at least 5 km length. The routes are non-randomly selected mostly in open habitats where a significant number of birds of prey are expected to occur. Until 2018 a total of 157 routes were completed at least once, but only 38 regularly. The distribution of routes is uneven across the country, large areas in Southern and Eastern Romania being uncovered permitting data interpretation only regionally. Trend analysis was performed separately for the two sessions. The number of species was highest in the Danube Delta area and in Western Romania. Overall birds of prey numbers were highest in Western Romania.

Significant differences in the abundance of widespread species among regions were observed for Rough-legged Buzzard *Buteo lagopus*, Hen Harrier *Circus cyaneus*, Goshawk *Accipiter gentilis* and Common Kestrel *Falco tinnunculus*. Numbers in February tended to be lower then in December for all species, with the exception of Rough-legged Buzzard, that was slightly more abundant in February. Common Buzzard showed moderate decline in Transylvania in both sessions, while in Moldova the population steeply declined in February, but was stable in December. Hen Harrier numbers declined steeply in Transylvania in February, but not in December. This pattern may be due to the earlier arrival of spring in recent years that triggers an earlier start of spring migration towards breeding grounds further north. In the case of Common Buzzard, an earlier return to forests, the breeding habitat, is also possible, a habitat type that is under represented in the sampling.

USING GIS TECHNIQUES TO IDENTIFY THE BREEDING AND OVERWINTERING GROUNDS AND THE MIGRATION CORRIDOR OF THE RED-BREASTED GOOSE

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Geographical Information Systems (hereafter, GIS) are powerful tools, widely used in interdisciplinary studies to model and study the interaction between biological and geographical systems. In the past decades, some species have changed their phenology in order to cope with their physiological needs under the pressure of increased anthropogenic impact. The Red-breasted Goose *Branta ruficollis* is a Vulnerable species that breeds in the Eastern Siberia (Taimyr, Gydan and Yamal Peninsulas) but during the inhospitable winter months it migrated to the North and Western Black Sea basin for feeding and overwintering. Here we implement a GIS model to estimate (1) the breeding and feeding grounds of the species under current climate conditions and (2) estimating the flight passage and the migration corridors used by the red-breasted goose between breeding and feeding grounds under current conditions. Since the feeding and overwintering grounds are dynamic, it is extremely important to understand how the Red-breasted Goose is responding to the change of resource availability as a first step in creating future strategies for the conservation of this species and its crucial habitat during the breeding and overwintering season, as well as during its migration.

INCREASE IN ABUNDANCE AND DISTRIBUTION OF WINTERING BARNACLE GEESE IN DENMARK

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The population of wintering Barnacle Goose *Branta leucopsis* in Northwestern Europe has increased enormously during the last decades. A large proportion of these occur in Denmark during winter. These birds are part of the Russian/Northwest European population, which is the largest and fastest growing population with an increase from 20,000 individuals in the 1950'ies to estimated 1.2 million individuals in 2014. DOFbasen (www.dofbasen.dk) is the main database on casual bird observations in Denmark and provides the data for a description of the population changes in this study. Despite the unsystematic nature of the data, the very high number of records of birds (1.5 million annually, 22 million in total) from all over the country makes these data highly useful to describe changes of distribution and phenology in the Danish nature. This knowledge is relevant for the management of a species like the Barnacle Goose. During winter, the species often forage on winter crops. Damage to agricultural crops has been registered all over the wintering range, with grassland as the most affected crop followed by winter and spring cereal. This have led to increasing conflicts with farmers due to the negative impact the foraging has on production and thereby the economy. Here we present recent changes in the abundance and distribution in the Danish Barnacle Goose winter population.

DISTRIBUTION AND POPULATION SIZE OF GREAT CRESTED GREBE IN SWITZERLAND

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The Great Crested Grebe *Podiceps cristatus* is a species of conservation concern in Switzerland because it holds large percentages of the flyway population both during the breeding and wintering seasons. Wintering numbers are well monitored during the International Waterbird Census. Breeding populations are more difficult to survey and population estimates are difficult. During the recent Swiss Breeding Bird Atlas 2013–2016 collaborators were asked to make specific surveys for Great Crested Grebe and other waterbird species with the aim to get better population estimates across the country. The Great Crested Grebe is widespread in Switzerland, mainly inhabiting the large lakes, but also slow-flowing rivers and smaller lakes. It can defend large territories, but may also breed in colonies. Colonies are often found on large lakes with an abundant supply of fish, but only few suitable nesting sites. As part of an international survey in 1975 the breeding population in Switzerland was estimated at 13,000 individuals and the wintering population at 29,000. Recently the Swiss population is estimated at 3,500–5,000 pairs, down from an estimated 4500–5500 pairs in 1993–1996. The substantial reduction of phosphorus concentrations in most Swiss waterbodies and the resulting drop in cyprinid fish stocks is thought to be one of the main reasons for the decline on some lakes. Other waterbodies however have seen an increase in numbers despite the reduced nutrient content. On the Central Plateau, distribution has remained largely unchanged since 1993–1996. Since then, the Great Crested Grebe has colonised new areas in the Alps, in particular the lakes in the Upper Engadine at almost 1800m; these breeding sites are 800 m higher than the highest sites recorded in 1993–1996.

VARIATION IN COMMUNITY TEMPERATURE INDEX IN POLISH BREEDING BIRDS: NO OVERALL INCREASE AND CONTRASTING TRENDS FOR FARMLAND AND FOREST SPECIES

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Changes in species composition of breeding bird communities are widely known effects of recent climate change. For a number of European countries, Community Temperature Index (CTI), an indicator measuring proportion of high- versus low-temperature dwellers in local assemblages, was reported to increase steadily across recent decades. Here we used data from Common Bird Survey conducted in Poland from 2000-2017 (18 years) to identify temporal and spatial variation in CTI for a community of 100 most common breeding birds. We estimated CTI at the country level and separately for 4 geographical regions, identified by differences in average spring temperature. On the country level, we could not detect increasing trend in CTI across analysed 18 years. Instead, CTI fluctuated in line with changing mean annual temperature (r=0.65, P=0.003), which showed a slight, non-significant, increase. Observed changes in CTI were arranged into alternate periods of increases and decreases, highly correlated with similar changes in mean temperature of the same year. CTI increases were linked with larger increases in abundance of hot-dwelling species. However, decreases of CTI were similar for both hot- and cold-dwelling species. At the regional level we found similar patterns, except for the western (warmest) part of Poland where CTI significantly increased over last 2 decades. Among farmland birds, which in general are declining, CTI was increasing, suggesting that cold-dwelling farmland species were disproportionately negatively affected. In contrast, CTI of forest species was declining, suggesting that the recently observed strong increase in common forest bird numbers was driven mostly by cold-dwelling species. Our results show that bird communities could rapidly adjust to thermal conditions on the breeding grounds, tracking closely prevailing temperatures, with no time-lags. Differences in CTI trends in farmland and forest bird communities suggest that climate change could have contrasting impacts depending on species ecology.

OPENBIRDMAPS, AN OPEN ACCESS BIRDING PORTAL FROM ROMANIA

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The importance of open-access data in biodiversity conservation, environmental education and scientific research is indisputable. The open data is a pivotal point for involving citizens in nature conservation, and thus it is the base of cooperation between the citizens and governmental institutes. The lack of a widely accessible general ornithological database in Romania motivated us to create the OpenBirdMaps (www.openbirdmaps.ro) as a part of the OpenBioMaps (openbiomaps.org) framework. OpenBirdMaps, launched in 2016 by Milvus Group Association, is dedicated to collect and freely publish information regarding the spatial and temporal distribution of wild birds in Romania. The aim was to create a user friendly system that stimulates amateur or professional ornithologists to share their observations. The main strength of OpenBirdMaps is the flexibility of the uploading and query interfaces. The uploading interface can be personalized for different bird survey methods. Users can easily upload or import data, such as occasional observations, complete lists and systematically collected data with specific methodology. Observations can be uploaded on points, line transects or polygons. The users are offered a wide variety of query options, including text and spatial queries, and following the query they are able to view/download a summary or data. Most (82%) of the 700,000 data available at the moment can be freely used for scientific, conservational and educational purposes. Plans for the near future includes the development of a mobile app, further increasing the ease of use, reaching back to users by offering user statistics and basic data interpretation, permitting data upload for other species groups than birds and creating a semi-automated data verification module. Through these we wish to further increase citizen involvement in data collection and sharing, facilitating nature conservation, research and environmental education.

DYNAMICS OF TUFTED DUCK AND RED-CRESTED POCHARD IN SWITZERLAND

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The lakes in the lowlands of Switzerland rarely freeze in winter and are important wintering areas for waterbirds. After introduction of the Zebra Mussel Dreissena polymorpha to the Swiss lakes and rivers in the second half of the 20th century, numbers of wintering Tufted Ducks *Aythya fuligula* increased strongly from around 30,000 individuals in 1967 to more than 200,000 in the eighties and nineties. This trend was also supported by new waterbird reserves and hunting bans. Since then numbers decreased again to about 100,000, which can be explained by climatic effects (wintering further north with milder winters) and probably a decrease in phosphorus concentration in the lakes leading to slower mussel growth. In parallel, numbers of breeding records in Switzerland increased from the eighties onwards, first only slightly on lakes and rivers near the wintering areas. From the nineties onwards expansion continued to many subalpine and alpine lakes at higher altitudes, further away from wintering areas. Today, mountain lakes accommodate around half of the total population of around 200 families. The highest known breeding place is at 2300 m a.s.l. Wintering numbers of the Red-Crested Pochard *Netta rufina* strongly and steadily increased from a few hundred individuals in the eighties to currently about 35,000 individuals, concentrating on large lakes. The increase began when Stonewort Chara spp. populations were recovering with decreasing phosphorus concentrations in the lakes. Today, around half of the Southwest/Central Europe flyway population winters in Switzerland. The number of breeding records increased simultaneously with winter numbers from a few to around 300 breeding records today. Unlike Tufted Ducks, Red-crested Pochards mainly breed close to the wintering grounds, including two accumulations of several dozen nests each year in two gull colonies.

WINTER DISTRIBUTION AND TRENDS OF WATERBIRDS IN ESTONIAN COASTAL WATERS IN THE PERIOD 1993 – 2018

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The first mid-winter count in Estonia was conducted first time in the winter of 1960/61. The project was run by Baltic Commission for the Study of Bird Migration. In 1967 Estonia was one of the first to join the International Waterbird Census (IWC) project, led by International Waterfowl Research Bureau (IWRB). From 1991 the project has been managed by the Estonian Ornithological Society. Initially the concept was an annual complete count, but starting 1991 the project was changed into a traditional monitoring programme, where counts are held on monitoring sites. From 1996 the mid-winter count is a part of the Estonian State Monitoring Programme. Most of the data of the IWC are collected by volunteers. Numbers of observers in Estonia are between 150 and 200. The count is held in January with centralised dates in the middle of the month. Estonian waters have been divided into 7 main sections, 20 subsections and 338 counting units. Depending on ice conditions and the coverage areas the coast of Estonia has been divided into monitoring and non-monitoring units. There are 98 monitoring sites in total on Estonian coast and 40 sites inland. Due to the winters getting milder the numbers of waterbirds have risen. The numbers have increased for Mallard *Anas platyrhynchos*, Goldeneye *Bucephala clangula*, Long-tailed Duck *Clangula hyemalis*, Mute Swan *Cygnus olor*, Tufted Duck *Aythya fuligula*, Smew *Mergellus albellus*, Goosander *Mergus merganser*, Red-breasted Merganser *Mergus serrator*, Great Cormorant *Phalacrocorax carbo*, and Greater Scaup *Aythya marila*. Numbers of Whooper Swan *Cygnus cygnus*, Velvet Scoter *Melanitta fusca*, Great Crested Grebe *Podiceps cristatus* and Black Guillemot *Cepphus grylle* remain stable. The numbers have decreased for Common Eider *Somateria mollissima* and all gull species. The number of the Steller's Eider *Polysticta stelleri* was in heavy decline, but they have stabilised over the past five years.

WHAT IS BOTHERING AUDOUIN'S GULL IN CROATIA – PRELIMINARY RESULTS OF BREEDING COLONIES SURVEILLANCE WITH CAMERA TRAPS

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The Audouin's Gull *Larus audouinii* (AG) breeds on small, uninhabited off-shore islands in Croatian part of the Adriatic Sea. Croatian breeding population is estimated at 60-70 pairs. Black Rat *Rattus rattus* and Yellow-legged Gull *Larus michahellis* (YLG) are known predators on AG eggs, chicks and adults and can affect its breeding success. Livestock can cause trampling and disturbance. Eight camera traps were set up in AG colonies on two uninhabited islands of Lastovo archipelago in the southern Adriatic Sea in order to examine the impact of predation and disturbance on AG. Camera traps were mounted in front of the nest containing eggs during the incubation period. Due to several malfunctions, period when camera traps were active vary between 17 and 44 days.

YLG was the predator with the highest sighting rate. Egg predation by rats and chick predation by YLG were recorded. Goats commonly caused ground intrusions, but with no evident damage. Due to high mobility of AG chicks and difference among shooting angles of camera traps, breeding success was not recorded. Chicks ringing resulted with only 0.13 and 0.69 fledged chicks per nest in colonies 1 and 2 respectively. While colony 2 breeding success (9 chicks from 13 breeding pairs) was in accordance with the literature, on colony 1 it was much lower (4 chicks from 29 breeding pairs). Only 5 nests at the colony 2 were monitored and it was not possible to identify the reason for such low breeding success. Presence and evident predating behaviour of both rats and YLG affected breeding success of AG. We recommend the maintenance of deploying camera traps in AG colony surveillance as a good tool for monitoring of predation pressure, urge on projects for finding solutions for mitigation of YLG pressures on AG population and starting rat eradication program on islets that hold AG breeding colonies.

INFLUENCE OF METEOROLOGICAL FACTORS ON AUTUMN MIGRATON OF BIRDS IN PAPE, LATVIA

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In this study, we looked at the impact of several meteorological factors on terrestrial bird migration. The impact of meteorological factors such as air temperature, cloud cover, wind direction and speed on migratory birds was analyzed. Bird species analysed in this study were Wood Pigeon *Columba palumbus*, Common Chaffinch *Fringilla coelebs*, Eurasian Siskin *Spinus spinus*, Bullfinch *Pyrrhula pyrrhula* and Thrushes *Turdus* spp. They were chosen because of sufficient amount of data collected during the study period. Data on migratory birds was collected over a two-year period, from 2017 to 2018, during September and October (total of 61 days each year). Three visual counts of migratory birds were carried out every day. Every count was 30min long with half an hour breaks between them. For all species the total sum of observed birds were recorded. Along the visual bird counts, meteorological parameters - temperature, wind speed and direction were automatically recorded at every hour. The amount of clouds was recorded by the observer. Almost all counts were done by one of the two observers (authors of this abstract). For all species, the most important factor is the wind direction, but air temperature is also an important additional factor for Thrushes and Bullfinch. The migration of Wood Pigeons is also influenced by the amount of clouds.

LAND USE CHANGE REDUCES COMMUNITY ADJUSTMENT TO CLIMATE WARMING OF WINTERING WATERBIRDS

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While the impacts of climate or land use changes on biodiversity have been largely documented, their joined effects remain poorly understood. We evaluated how wintering waterbird communities adjust to climate warming along a gradient of land use change. Using mid-winter waterbird counts (132 species) at 164 major sites in 22 Mediterranean countries, we assessed changes in species composition, regarding thermal niche position and breath, over 1991-2010, in response to regional and local winter temperature anomalies and to natural habitat conversion. We showed that in response to temperature increase, communities get relatively richer in warm-dwelling specialist species and poorer in cold-dwelling species, but this adjustment to climate warming was strongly limited by natural habitat conversion. When natural habitat conversion increased, the increasing species were those with broader niche, independently to their thermal affinities. The strong negative impact of natural habitat conversion on community adjustment to temperature increase suggests an antagonistic interaction between climate and land use change. These results underline the importance of habitat conservation to mitigate the impact of global warming on biodiversity.

CITIZEN-SCIENCE DATA PORTAL CAN HELP PRIORITIZED HIGH-VOLTAGE POWER LINES ASSOCIATED WITH BIRD COLLISION RISK

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High and very-high-voltage power lines have been identified as a major human-induced source of mortality for birds. When birds fly in large groups, or in poor visibility conditions, they can collide with these structures, in some instances in sufficiently large numbers to raise concern. On existing power lines, a cost-effective manner to decrease collision risk involves placing markers or "diverters" on the lines, in order to make them more visible to birds. In order to prioritize the placement of diverters on the 5,000km-long high-voltage power line network in Belgium, we mobilise bird distribution data through citizen-science, with two complementary approaches. First, we use bird data collected by field birdwatchers through citizen-science portal to build high-resolution map of bird density across Belgium, for the bird species identified as sensitive to power line collisions. This map is then used to point out areas of high concentration of sensitive birds, and the lines crossing those areas are tagged as priority. This theoretical map is refined by field visits where, in particular, local bird movement (i.e. flyway to roost sites) is identified. Second, through mobilization of observer networks and the use of different media, we encourage birdwatchers to actively mention precise location of bird casualties with power lines encountered in the field in the global biodiversity recording portal www.observation.org. hese two combined approaches identify high collision risk line sections where the electricity transport system operator in Belgium, ELIA, can place bird collision diverters on dangerous wire.

NOCTURNAL FLIGHT CALL MONITORING: POTENTIAL AND STANDARDS FOR QUANTIFYING BIRD MIGRATION

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Many bird species migrate largely, or exclusively at night, while others engage in nocturnal activities such as display flights and movements to nocturnal foraging grounds. There are several methods by which nocturnal bird activity can be studied, and all have strengths and weaknesses. Recording the vocalisations of night-flying birds has been popular in North America for over a decade but only recently has it gained widespread popularity in Europe and elsewhere. While the factors motivating individual recorders vary, the recent large growth in nocturnal sound recording presents the potential for valuable large-scale data to be collected. With some thoughts regarding standardisation, such data could inform questions concerning species composition, magnitude and timing of nocturnal bird migration, and complement insights from other observation methods. We review the strengths and weaknesses of data derived from nocturnal flight call recording, highlight challenges for extracting standardised data, and introduce a recently developed protocol that aims to provide best-practice guidelines for people engaged in standardised nocturnal flight call monitoring.

POPULATION TRENDS OF BIRDS OF PREY IN FINLAND

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The Common Birds of Prey Survey started in Finland in 1982. Monitoring relies on volunteers and is coordinated by the Finnish Museum of Natural History Luomus. The survey is based on Raptor Grid study plots of 100 km² (130 yearly) from which all territories and nests are reported, and a Raptor Questionnaire that compiles information from raptor ringers on nest types, territories and occupied nests with breeding results. Some 38,000 nest sites are checked annually. Long-term trends of raptors are modelled based on Raptor Grid data using the program TRIM, and breeding parameters are calculated based on the Raptor Questionnaire data.

Hawks of mature forest (Honey buzzard *Pernis apivorus*, Northern Goshawk *Accipiter gentilis* and Common Buzzard *Buteo buteo*) are declining in Finland (long-term population trends of −2.0%, −0.6% and −1.7%, respectively) likely due to intensive forest management and decreases in areas of old forest. A Forest Raptor project of Luomus aims at supporting these species. Also the northern breeder Hen Harrier *Circus cyaneus* declines at the rate of 2.5%. Populations of the Common Kestrel *Falco tinnunculus* and Hobby *F. subbuteo* are increasing (4.5% and 0.9%) while the Western Marsh Harrier C. aeruginosus population has remained stable for the last 15 years. The Eagle Owl *Bubo bubo* population is declining (−2.9%) due to reductions in easily available food in dumping sites. Annual fluctuations of many owl species depend on vole cycles and trends cannot be estimated for species occurring sporadically such as the Great Grey Owl *Strix nebulosa* and Short-eared Owl *Asio flammeus*. However, according to the long-term population trends, the Ural Owl Strix uralensis is increasing (1.0%), Tawny Owl *S. aluco* is stable, and the vole specialists Long-eared Owl *Asio otus* and Tengmalm's Owl *Aegolius funereus* are declining at the rate of 2.2% and 2.4%, respectively.

UNDERSTANDING THE MOTIVATION OF VOLUNTEER BIRDWATCHERS

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Birdlife Denmark's (DOF) two big citizen science projects, the Atlas III and Point count census program relies on the fundament of data collected and reported by volunteer birdwatchers. Thus, this volunteer contribution creates the opportunity to perform further analyses and results documenting the state and tendencies for birds in Denmark. Thereby, possibilities are created for research and surveillance that would not be possible otherwise. Bird counts in DOF's bird count census programme are one of the activities that has gained largest appliance in Danish nature management purposes. To gain insight into what motivates volunteer birdwatchers is therefore a valuable tool in the knowledge pool that underlies the fundamental values of Citizen science-based research. In 2017, DOF conducted a study of what motivates DOF's active birdwatchers in their volunteer work. The online survey was distributed by email to all the volunteer grid cell supervisors in Atlas III and to the Point Count Census volunteers by email. The questions posed in the survey had several preformulated responses that could be checked, (multiple choice) but some of the questions posed were also open ended, and personal comments and suggestions could be included. A total of 248 volunteer grid cell supervisors and 148 point count census volunteers answered the questionnaire. Subsequently, DOF conducted personal interviews with 9 active volunteers who were compelled to share their behind-lying motivation and experiences as DOF volunteers. The overall responses indicate that the conservation of birds and the opportunity to actively contribute to the collection of data and knowledge is the foremost motivational factor, while the details of the studies aim, and organization and the contributory effort needed from the volunteers, also was an important motivation for the participatory level and motivational factor.

COMMON BIRD CENSUS IN PORTUGAL - RECENT TRENDS AND FUTURE PERSPECTIVES

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The Common Bird Census (CAC) is a national monitoring scheme that started in 2004 with the purpose of assesses trends of common breeding bird species and to use them as an indicator of the health of the environment. CAC also integrates the Pan-European Common Bird Monitoring Scheme, contributing for the long-term monitoring of common birds at a European level. This census is based on point counts within 10x10km squares across the Portuguese mainland, Madeira and Azores archipelagos, which are monitored by volunteers twice every spring. In this update, we present the more recent trends for 65 common bird species in Portugal (2004-2018) as well as multi-species indicators (farmland, forest and others) based on Monte Carlo simulation of annual species indices. Recent short-term trends are also compared to previous tendencies, to highlight current changes in common breeding bird populations. While some common bird species maintained their long-term demographic tendencies (Moderate Decline: Woodchat Shrike *Lanius senator*, European Bee-eater *Merops apiaster*, European Serin *Serinus serinus*), other species changed their status from stable to moderate decline in recent years (*e.g.* European Goldfinch *Carduelis carduelis*, House Sparrow *Passer domesticus*, Stonechat *Saxicola torquatus*). Considering the importance of these indicators to inform the general public and policy makers, it is also necessary to guarantee the long-term engagement of volunteers and to increase the spatial coverage of the monitoring scheme.

TAKING THE MEASURE - QUANTIFYING OBSERVER KNOWLEDGE TO IMPROVE DETECTION PARAMETERS IN NICHE-MODELS

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One of the greatest factors influencing detection probability is the observers' ability to spot and identify different bird species. While including the observer as a factor in trend and distribution modelling, as well as accounting for the first-time observer effect, none of these methods addresses the species-identification skill and the learning-curve associated with it. Hereby we present an index used in our relative abundance models for the Romanian Breeding Bird Atlas. Each survey plot used in the model was assigned to one of nine ecological regions, assuring a certain amount of species-homogeneity. The index was calculated based on the total number of species observed and plots surveyed in the respective region, taking into account not only the number of species observed, but also the number of plots visited by each observer, thus being more forgiving in the case of observers with few plots. Using the cumulative number of species observed for each year, the index also reflects the learning-curve of the observers. In our models, in order to cover most aspects of the observer-related variance, we also used the cumulative number of data collection visits, thus quantifying our field-workers' growing experience with the survey method. These two covariates not only got a generally high score when ranking the covariates by importance, but also seemed to improve our models.

MASS PARTICIPATION CITIZEN SCIENCE - FINDINGS AND OPPORTUNITIES

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Around half a million people, adults and children, take part in the Big Garden Birdwatch (BGBW) annually across UK and Isle of Man. This RSPB activity provides enormous potential to communicate with a huge group of people about changes in wildlife in their gardens. Key results provide opportunities to communicate changes in bird populations over time in a way that resonates with people and what they are seeing in their own gardens. Annual top 10: an annual snapshot of the abundance of species using our gardens during winter months. 40 years of BGBW: long term changes in numbers of birds using our gardens, comparable over time because of the consistent, simple method. Regional comparisons: to demonstrate how species distributions and trends vary across the UK. Additionally, it is possible to identify years when there is an influx of birds from continental Europe, species such as Redwing *Turdus iliacus* and Waxwings *Bombycilla garrulus*. This is an opportunity to increase knowledge and understanding about our less common visitors. Future potential analyses could explore patterns in bird numbers in relation to features in our gardens to try to assess the effectiveness of wildlife gardening interventions. These analyses would need to be explored in the context of larger-scale variables such as habitat availability in the surrounding area.

STATISTICAL POWER OF BIRD TREND MODELS OF THE ROMANIAN COMMON BIRD MONITORING SCHEME

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Common bird population trends are one of the most important biodiversity indicators in Europe. Despite their importance, calculating population trends represent a major challenge for countries with relatively young monitoring programs. In Romania the Common Bird Monitoring Program is running since 2006, with high coverage fluctuations between the years, covering 202 plots with at least 3 visits. Using the "rTRIM" package developed for the R statistical environment, we have obtained overall trends for 75 species for 2007-2018. The statistical power of all models was extremely low (Chi-square: $p<0.0001$, Likelihood Ratio: $p<0.0001$). By restraining our estimates to only complete count series for the programme's 12 years we have managed to raise the models' statistical power (Chi-square: $p>0.05$, Likelihood Ratio: $p>0.05$), but leaving only a few plots ($n=6$), hence sacrificing the spatial representativeness of the calculated population trends. By comparing the two sets of estimates, overall population changes have remained consistent, thus we consider that our calculations using the complete data set, despite the low statistical power, offer valuable information about the changes of common bird populations. The present poster aims to start a discussion about the possibilities of enhancing our data analysis to obtain better estimates and more robust results, which meet the better statistical power.

BIRD OBSERVATORY DATA: MONITORING PHENOLOGY AND POPULATION ABUNDANCES

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Volunteer birdwatchers have been collecting data on migratory birds from many bird observatories for tens of years. Such data could be used for instance to monitor changes in species phenology and population abundances. However, observatory data is often "messy" including gaps in observation coverage and high daily variation due to local weather conditions. We will present a simple method how to investigate changes in phenology and population abundances using data of the Hanko Bird Observatory, Finland, over 40 years. In addition, we will compare how the observed changes in population abundances are linked with the population trends based on breeding surveys (common bird monitoring, etc.) and investigate what type of species most and least parallel trends.

CHANGES IN EUROPEAN BIRD POPULATIONS ALONG WATERWAYS

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In the UK, riparian specialists are most effectively monitored by the Waterways Breeding Bird Survey, where volunteers annually and regularly count birds along randomly-allocated transects parallel to linear waterways. Additional information on the status of wetland and riparian species is provided by landscape-generic schemes such as the Breeding Bird Survey. Results reveal long-term patterns of changes in abundance that differ between species associated with fast-flowing rivers, still water bodies, reed beds and wet grasslands, as well as some differences in trends in different habitats. Declines in species such as Common Sandpiper *Actitis hypoleucos*, Dipper *Cinclus cinclus* and Grey Wagtail *Motacilla cinerea* reflect patterns across northern Europe. Although many species show improved productivity as they recover from the negative impact of acidification, current declines may be linked to climate effects during the winter or on wintering areas south of Europe. Most species associated with ponds and lakes are increasing, attributable in recent decades to more and improved wetlands, whereas waders dependent on wet grasslands show the steepest declines. We review the evidence for threats to waterways and wetland birds across Europe and explore the potential for riparian or other wetland indicators.

HOW THE UK RARE BREEDING BIRDS PANEL CONTRIBUTES TO POPULATION MONITORING IN THE UK

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The UK Rare Breeding Birds Panel (RBBP) has collected data on the rarest breeding bird species in the UK since 1973. We will outline its unique position in British ornithology, working with government agencies, non-government organisations and a broad range of amateur volunteers located across all areas of the country. The RBBP uses a wide variety of sources to populate a database of sites and species. Data thus collated are used to produce annual reports, reliable population estimates and trends for upwards of 60 species, many of which are too scarce to be adequately monitored by other national schemes. The data also support the designation of sites to protect rare breeding birds. Some examples of the outputs produced by the RBBP will be shown.

WINTERING WATERBIRDS IN BELGIUM: AN UPDATE ON TRENDS AND NUMBERS

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Situated near the southern North Sea and privileged with a mild winter climate and rather low hunting pressure, Belgium offers some favourable wintering conditions for waterbirds. Despite the rather small size of the majority of Belgian wetlands, several species are recorded in internationally important numbers. Because monitoring of waterbird populations in Belgium is organised at the level of the three autonomous regions, it is sometimes difficult to obtain information about population size and trends on the national scale. However, within the framework of the reporting under Article 12 of the Birds Directive, experts from Wallonia, Brussels and Flanders join forces every six years to compile the regional information into national data. This allows us to make population and trend estimates for the whole of Belgium. Most waterbird counts are conducted on a monthly basis between October and March and rely on the participation of specialised volunteers. In recent years, about 1,000 sites were counted on a regular basis. For some species (*e.g.* gulls), additional roost site counts are organised. Here, we present some new results of the waterbird monitoring programme in Belgium, based on the most recent data (updated until the winter 2017/18). For a selection of species, we show national population estimates and both long and short term trends in numbers. In many species, national trends are influenced by developments on flyway level. Both the trend of the total population (*e.g.* decrease of Common Pochard *Aythya ferina*) and large scale distribution shifts (*e.g.* shift of Pink-footed Goose *Anser brachyrhynchus* from the Low Countries to Denmark) can be involved. In some cases, also local factors in the wintering areas can have a major effect on waterbird numbers in Belgium (*e.g.* the rise and fall of Common Teal *Anas crecca* numbers in the Schelde estuary because of changes in water quality and food availability).

HALF A CENTURY OF THE BIRD MONITORING IN KABLI RINGING STATION, ESTONIA

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Kabli ringing station (established in 1969) is located in south-western Estonia. Since 1972, a standardised trapping scheme with large Helgoland trap and small number of mist nets is carried out in Kabli. Up to 2018, more than 680 000 birds were ringed within the standard scheme and most of ringed specimens are forest passerines (>80 % ringed specimens are Paridae and Sylvidae).

We studied long-term multi-species indices of groups of species according to species breeding habitat preferences and migratory strategy. Declining trends were detected in several species groups. Species which prefer breeding in coniferous forests and late successional forest habitats have declined roughly 50%. Also, partially migratory and short distant migrants have a continuous decline in the studied period. Contrary to that, species of deciduous forest habitats and early successional forest habitats and also long-distant migrants show different dynamics - increasing trend in 1980-s and sharp decline in 1990-es. The findings imply that the species groups consisting mostly of long-distant migrants suffer due to the pressures on wintering areas in Africa or on migration routes. On the other hand, species groups consisting mostly of sedentary and partially migrant species may suffer due to increasing pressure on management of forest habitats in NE Europe since 1990-ies.

THE FIRST SUCCESS OF REINTRODUCTION IN THE WILD OF THE BLACK STORKS BORN IN CAPTIVITY IN UKRAINE

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Black Stork (*Ciconia nigra*) is a rare species. There are about 800 pairs in Ukraine. Kyiv Zoo scientists have started a program of developing methods for stable breeding in captivity and reintroduction of this species in the wild. From 2015 to 2018 years, 1–3 pairs per year bred in the zoo and a total of 12 chicks were born. It was decided to release three birds born in 2017 in the wild. Two of them were fed by their parents, and one bird was fed manually by zoo keepers. At the end of June 2018, the birds were transferred to the Eco-Galich rehabilitation center (Ivano-Frankivsk region) to acclimatize to life in the wild. They were kept in the large enclosure with a pond, where they learned to hunt for live fish on their own. August 3, 2018, birds were ringed and released in the wild on the territory of Galician National Park on Limnitsa River, where migration of wild Black Stork takes place.

As a result, the first bird, fed manually by the zoo keepers, after 12 days was caught in the village by local residents. The second bird was last seen at the place of release on August 11, its further fate is unknown. The third bird was last seen at the place of release with the young wild Black Stork on September 9, 2018, and on January 2, 2019, Petros Tsakmakis observed this bird in Greece on the island of Lesbos, which lies on the path of migration of the natural population of Black Storks of Eastern Europe. The distance between the place of release and the place of observation is 1125 km. This fact proves that Black Stork grown up in captivity and properly acclimatized can live in the wild and migrate.

TRENDS IN THE WATERBIRD POPULATION IN THE RAMSAR SITE OF SANTOÑA, SALT MARSHES (N SPAIN)

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The analysis of waterbird population changes is useful for assessing the health of wetlands and monitoring environmental changes. Santoña Marshes is a key wetland situated in North Iberia within the East Atlantic Flyway. This coastal wetland represents an Area of National Importance during winter for 20 waterbird species. During twenty consecutive annual cycles a monthly census was carried out always during low tide, one of the most extensive data sets in Spain.

Over the years which the monthly censuses were carried out (January 2000 - January 2019) a total of 144 species of waterbirds were registered in the study area. The average monthly population varies from 1,690 birds in May to 16.292 in January. During the winter (January) the site supported an average of 16,292.95 ± 734.86 waterbirds, about 0.86 % of the total present in Spanish wetlands and in first position considering only the cantabrian coast. The most abundant species were the dunlin *Calidris alpina* and the wigeon *Anas penelope*, representing around 45% of the total numbers registered.

The total number of waterbirds showed a positive trend between 2000 and 2008 and a negative trend from 2009 onwards. Of the 32 species analysed, 15 displayed a positive rate of change, 8 underwent a negative change and 9 a stable trend.

The long term monitoring scheme run by SEO/BirdLife and Cantabria regional government has allowed us to show the reduction of the wintering waterbirds birds and the appearance of new species coming from the south. Climate change is identified as the main driving factor of these trends. The changes for the main species according to their specific foraging habits are showed and some measures for the future are also proposed. Finally we revised and update the status of the waterbird community.

WINTER ABUNDANCE TRENDS OF LAND BIRDS IN EUROPEAN RUSSIA: AN ANALYSIS OF LONG TERM STUDY DATA WITH TRIM SOFTWARE

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Since early 1980-s, "Parus" program coordinates winter land bird census on an extensive network of study sites across European part of Russia. The territory of about 3.3 million km² was divided into longitudinal sectors of 5 forest subzones (2–4 sectors in each subzone). Volunteer observers conduct long-term annual censuses on 25 study sites. On every site, censuses are made on at least 20-km route for one or more dominant forest types. We analyzed winter abundance trends for 17 most abundant species over the period 1987–2018. Using rtrim package for R 2.0.6, we estimated missing data for all study sites. For each sector, we averaged winter population numbers, considering the area of forest habitats appropriate for each species. These assessments, divided by number of study sites in each sector, were used as weight coefficients in trends calculations. We obtained population indices and calculated trend parameters for the whole study period, as well as its first and second parts (before and after 2002).

Using MSI tool for R, we calculated multispecies index (MSI) for 16 wintering species (all studied species except Common Crossbill). None of the species had positive trends in any period. During 32 years, 5 species showed stable trends, and 8 of them demonstrated significant population decline, in many cases accelerated since early 2000-s. The decline was most pronounced in Willow Tit (*Poecile montanus*), Great Tit (*Parus major*), Goldcrest (*Regulus regulus*) and Eurasian Nuthatch (*Sitta europaea*). The resulted MSI also showed moderate decrease (-1.5% / year). The causes of such tendencies remain unclear, but for most of the studied species they probably reflected the changes in tree composition, caused by intense logging in the taiga zone. It had resulted in a dramatic decrease of old coniferous forests area, which was substituted with young, mostly deciduous stands. Other factors such as climate change might also play a role.

MAP - THE HUNGARIAN BIRD OBSERVATION DATA COLLECTION SYSTEM

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In Hungary before 2014 there was no online bird observation data collection system (DCS), commonly used and able to collect complete lists. Several bird monitoring schemes were present at that time, but their online DCS were only able to collect project data.

When the EBBA2 project was launched, it became necessary for MME BirdLife Hungary to develop a generally used DCS. The MAP DCS was launched in March 2015, and from the outset the importance of collecting the complete lists was at the heart of the developments. At first, our aim was mainly to serve EBBA2 and Hungarian Bird Atlas projects, and the data collected during mainly in breeding seasons, but later in the further developments we extended the data collection for the whole year and for all types of bird watching data. Due to these developments, we have been able to provide from the MAP data for the Euro Bird Portal project in recent years.

Until the end of 2018, 43,800 complete lists were uploaded on MAP. In four years, 620 users uploaded 2 million observation data from 1,700 observers. 93% of the data collected after 2015 comes from complete lists. In recent years, we have also integrated a large number of previously collected archive data into the MAP system. Through continuous development, we have built a number of features (maps and graphs) that provide interactive presentation and query ability. Our long-term goal will be to collect data from all bird monitoring programs and any other sources in the MAP, therefore we don't stop developing the system.

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