Bird Census News

Journal of the European Bird Census Council

www.ebcc.info

2020
Volume 33 n°1–2

Bird Census News

2020, volume 33 n° 1–2 (published February 2021)
ISSN 1381-5261
Free download pdf from www.ebcc.info

Bird Census News is the Journal of the European Bird Census Council or EBCC. The EBCC exists to promote the organisation and development of atlas, census work and population studies in all European countries; it promotes communication and arranges contacts between organisations and individuals interested in census and atlas work, primarily (but not exclusively) in Europe.

Bird Census News reports developments in census and atlas work in Europe, from the local to the continental scale, and provides a forum for discussion on methodological issues.

Cover illustration by Evgeniy Koblik

Bird Census News
Volume 33/1–2, February 2021

EDITORIAL

Winds of change

The world has changed quite considerably in a year. The COVID epidemic has affected the lives of all of us. In the midst of all the uncertainty and challenging times, it is important that there is also positive news. From the point of view of bird monitoring, such pleasures have included the publication of the second European Breeding Bird Atlas, EBBA2, and several national bird atlases. These signal that life continues in the midst of adversity. Continuity is important, not least because most of us collect data for long-term monitoring. This issue of BCN reports on two significant monitoring projects: long-term monitoring of wintering land birds in Russia during last 30 years and the European Goose Management Platform.

However, let us return to the atlas mood for a moment. EBBA2 was released in late 2020 and was immediately followed by the first Russian breeding bird atlas. After a huge atlas effort, it's good to stop for a moment to think. How does it feel now? What next? In the new BCN series of articles, we interview two key persons in the EBCC: Verena Keller, who piloted the European bird atlas, and Mikhail Kalyakin, who lead the Russian bird atlas. In the midst of all the changes, we have also been thinking about changes to the content of Bird Census News.

In addition to the series of interview articles, another new series of articles is launched in this issue, that aims to describe different online portals for national monitoring schemes. These two new series of articles are intended to diversify the content of BCN and, we hope, provide an interesting and popular format. I hope you enjoy these changes! Feedback on these changes is warmly welcome.

Aleksi Lehikoinen

Editor Bird Census News

CONTENTS

Bird Census News 2020, 33/1–2: 3–13

PARUS program: wintering land bird monitoring in European Russia

Ekaterina Preobrazhenskaya[1], Anton Morkovin[2*]

[1] A.N. Severtsov Institute of Ecology and Evolution, Leninskiy av. 33, 119071 Moscow, Russia
voop21@rambler.ru
[2] Zoological Museum of M.V. Lomonosov Moscow State University, Bolshaya Nikitskaya Str. 2, 125009 Moscow, Russia
a.morkovin@yandex.com
* Corresponding author: Anton Morkovin a.morkovin@yandex.com

Abstract. For more than 30 years, the PARUS program has implemented annual censuses of wintering birds across a network of model sites in the European Russia forest zone. The scheme is run mostly by volunteers who make transect counts; it enables the estimation of bird population density in typical forest habitats. We present an analysis of wide-scale population trends in forest habitats using TRIM software for 17 common birds. Between 1988 and 2019, seven species had decreasing trends, populations of nine species were stable, and none showed a significant increase. Species associated with coniferous trees had a more pronounced decline in comparison to generalist species; declines were most dramatic for Goldcrest *Regulus regulus*, Willow *Poecile montanus* and Coal Tits *Periparus ater*. Similar tendencies were reported with monitoring schemes in neighbouring countries. We suppose that main negative factor was intense logging in boreal forests; climate change could also play a role.

Introduction

Bird dynamics are a widely used indicator for wildlife monitoring purposes, as birds are numerous and ecologically variable group which are relatively simple to count (Koskimies 1989). Usually, monitoring schemes are concentrated on the breeding season. However, population estimates on other life cycle stages are also important for the understanding of species' ecology and environment drivers of population changes. Winter survival influences breeding abundance in the next season and changes in winter conditions can be a crucial factor in determining multi-year population dynamics. Additionally, the state of resident species' populations can be more relevant environment indicator than migrants, whose dynamics depends on their wintering ground conditions (Fraixedas *et al*. 2015).

The aim of the PARUS program is the large-scale monitoring of wintering land birds in European Russia. The total area of the region is 3.3m km^2, and about 1.655m km^2 is covered with forest (Shchepashchenko *et al*. 2015). For many species wintering in the forest and forest-steppe zones, this territory is the main population reservoir playing the crucial role in population dynamics. The program was started in 1986; during the first years, it increased its coverage and has been producing comparable data since 1988, encompassing the majority of the target region. Today it unites more than 200 participants annually, who make regular censuses on more than 25 model sites (Bogolyubov & Preobrazhenskaya 2017; Fig. 1). Wintering bird censuses are made in typical, mainly natural landscapes, both forested and open or mosaic.

The purpose of this article is to introduce the PARUS program coordinated by E.S. Preobrazhenskaya (Bogolyubov & Preobrazhenskaya 2017), as the scheme is not necessarily familiar to many European ornithologists, and to present the results of 31 years of monitoring (1988 to 2019) for the 17 most common species in forest landscapes. Previously these data were analyzed only on the regional level (Preobrazhenskaya 2011, 2017); here, we use TRIM software (Trends and Indices for Monitoring data; Bogaart *et al*. 2018) to assess general tendencies for the whole territory.

Methods

The study sites were distributed across the forest belt of European Russia (some sites located

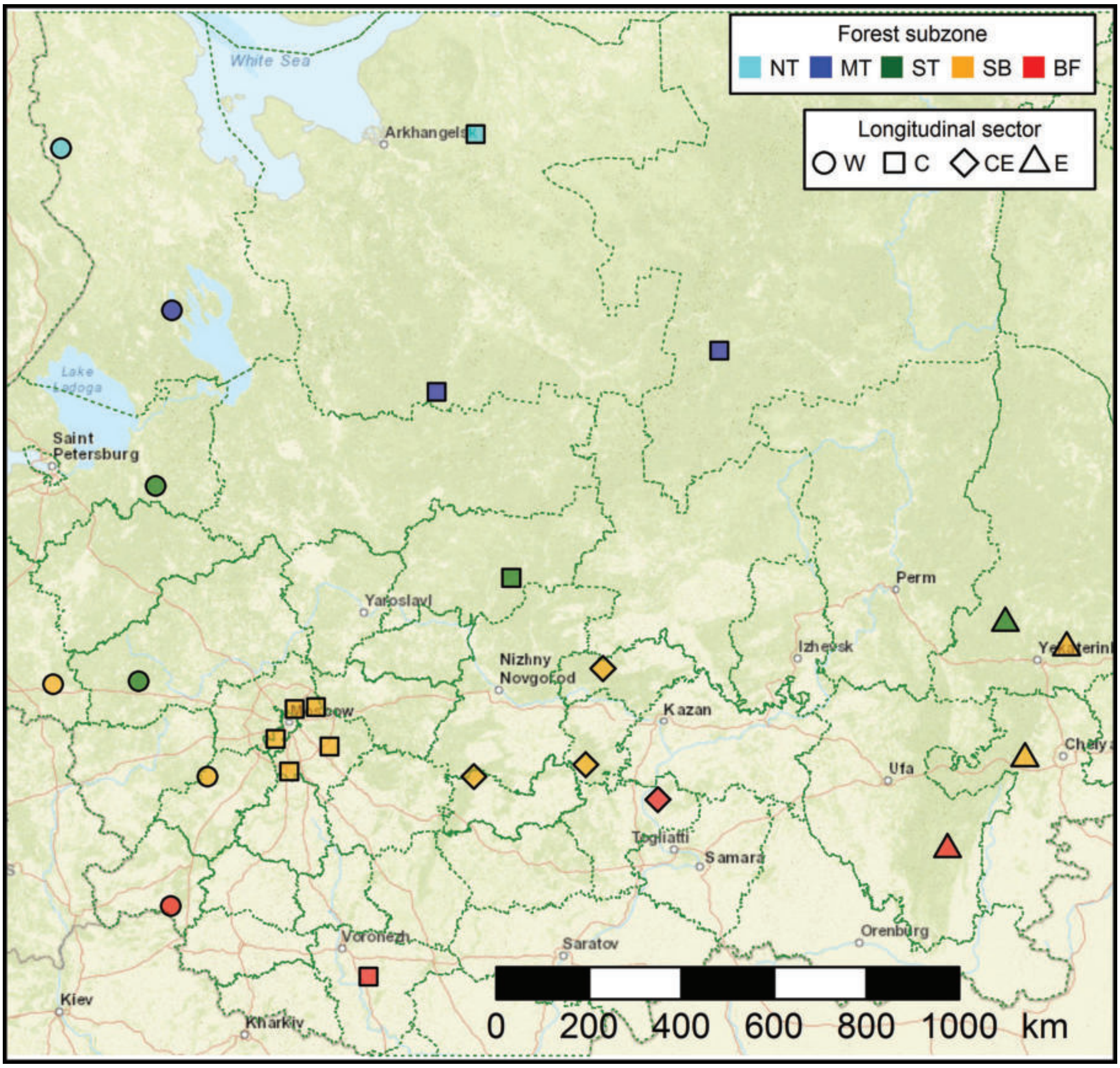

Figure 1. Locations of the PARUS program monitoring sites. Colours show forest subzone: NT — Northern taiga, MT — middle taiga, ST — southern taiga, SB — subboreal forests, BF — broadleaf forests. Symbols indicate different longitudinal sectors: W — Western, C — Central, CE — Central-East, E — East.
The map: © OpenStreetMap contributors; green colour — forest, yellow-green — open landscape, blue — water bodies.

in the westernmost part of South Siberia), divided into five subzones (the northern, middle and southern taiga, the subboreal (mixed) forests and the broadleaf forests including island forests in the forest-steppe zone). Each subzone included three or four longitudinal regions: Western, Central, Central-East (in two southernmost subzones only) and East. This resulted in 17 sectors (combinations of forest subzone and longitudinal regions), all of which, with the exception of the most remote eastern sectors of northern and middle taiga, contained at least one study site (Fig. 1). In each site, one or several distinct forest habitats prevailing in the landscape were chosen for study. Clear-cuts, young stands and settlements were omitted.

Route censuses were made in December–February using the method proposed by Ravkin & Luk'yanova (1967). While walking a linear transect, the observer writes down the number of birds and radial distances to individuals or flocks in the moment of registration. These radial distances, grouped into five intervals (<10, 10–25, 25–100, 100–300 and >300 m), are used to obtain a coefficient which allows one to calculate the population density using the number of registered individuals. This coefficient, called effective census band, is counted as the harmonic mean of registration distances, separately for birds with different perceptibility — just sitting or moving in the canopy, singing, and flying. The density of each group is the product of this coefficient and the number of counted birds, divided by the transect length. For flying birds, the value was additionally divided by average flight speed, typically assumed as 30 km/h. The final population density is the sum of values of all groups (Ravkin & Luk'yanova 1967). Most observers did not record distances by themselves, and their data were processed with pre-obtained standard coefficients specific for different species, habitats and forest subzones (Bogolyubov & Preobrazhenskaya 2017).

Censuses were made either on a random or on a constant transect not less than 2 km long, crossing more or less uniform landscape (e.g. coniferous or deciduous forest). Transects were chosen freely by fieldworkers and sometimes were changed for a new one at a distance of no more than 100 km away from the previous one. The total length of census routes in a study site per winter season was at least 20 km for each habitat.

During the multi-year survey, time series of annual density values were produced for every species in each study site. If several habitat types were explored within a site and a species density significantly differ among them, these habitats were treated as separate time series. Otherwise, the density values were averaged for all habitats. If a habitat type was completely or almost avoided by a species, it was excluded from calculations.

We used *rtrim* 2.1.1 package for R 4.0.2 (R Core Team 2020) to estimate missing data and calculate trend parameters. The function *rtrim* fits log-linear Poisson regression to the data and provides annual abundance indices as well as slope for a multi-year population change (Bogaart *et al*. 2020). As the forest zone sectors differed strongly in the area of suitable forests, they made an unequal contribution to the total population dynamics. Because of this, we used weight coefficients reflecting the relative impact of time series. We consider each site as equally contributing to the population dynamics within a sector. If a site contained several time series, its weight was distributed among them proportionally to the area ratio of corresponding forest types in the sector. Thus, the weight coefficients (***W***) for a time series was calculated in the following way:

$$W = F \times P / N,$$

where ***F*** is the forest area in a sector, ***N*** is the number of study sites within a sector and ***P*** is the proportion of habitat type corresponding to a time series (equal to 1, if only one habitat type was studied within a site).

The forest area was calculated with state forestry data (USSR forest fund 1990; Russian forest fund 2003), using average figures for 1988 and 2002 (without young stands; Table 1). However, these estimations are very rough; the between-year differences apparently did not show real forest dynamics, due to differences in assessment methods and quality. Because of this, we used constant weights for all years, though actually their figures might change over time. Six species are considered to be conifer forest specialists: during the winter season, they predominately use coniferous or mixed forests, which are typical late-succession habitats on the whole studied territory except the southernmost subzone. Other species use deciduous forests as well, sometimes along with non-forest habitats, or even prefer them (Dement'ev & Gladkov 1954). Accordingly, for each species we selected the area of coniferous and mixed, deciduous or all forest stands (Table 2).

We made estimations of species abundance in different ecological regions, having calculated their multiyear average density and population size for each forest subzone. Population size was obtained as the product of average density and the area of forest habitats used in trend calculations. Definitely, these estimations were very rough and cannot be considered as complete, because not the whole spectrum of habitats was explored. Nevertheless, they allow us to reveal general patterns of species distribution across the forest belt and to compare the relative importance of different subzones as species wintering area.

To obtain annual population indices and multiplicative trend parameters (log-growth rates), we used the linear trend model with corrections for autocorrelation and overdispersion in *rtrim*. All years were included as changepoints and the stepwise procedure was used to remove non-significant ones. For population indices, the base period was set on 2017–2019 years, because fewer routes were missed during this period than in the initial years. For assessment of dynamics tendencies, overall trends for imputed indices were used.

To check the possible association between species characteristics and multiyear changes, we compared multiplicative trend parameters using weighted Mann-Whitney test (*weighted_mann-whitney* function in *sjstats* 0.18.0 package for R; Ludecke 2020). As trend parameters had unequal preciseness, the reverses of their standard errors were used as weight coefficients.

Table 1. Forest area (thousands of ha) for different forest subzones and longitudinal sectors of European Russia. Average values for 1988 and 2002 years (USSR forest fund 1990; Russian forest fund 2003). Young stands excluded. C — coniferous and mixed forests; D — deciduous forests; A — all forests. Acronyms for forest subzone are NT = Northern taiga, MT = middle taiga, ST = southern taiga, SB = subboreal forests, BF = broadleaf forests, and acronyms for longitudinal sectors are W = Western, C = Central, CE = Central-East and E = East.

Zone	Sector	C	D	A
NT	W	3649	421	4070
	C	5817	683	6500
	E[1]	6530	710	7240
MT	W	3548	582	4130
	C	20608	3322	23930
	E[1]	7041	1409	8450
ST	W	4491	2099	6590
	C	4596	2744	7340
	E	2488	1052	3540
SB	W	1342	919	2260
	C	1718	1192	2910
	CE	2322	2358	4680
	E	2257	793	3050
BF	W	353	397	750
	C	552	1128	1680
	CE	477	2034	2510
	E	1865	2965	4830

[1] No censuses were made in these sectors

The multi-species indicator (MSI) summarizes the general state of the forest wintering birds community; it is defined as the geometric mean of species indices (Gregory *et al*. 2005). We calculated it with the MSI tool for R (Statistics Netherlands 2017, Soldaat *et al*. 2017), also allowing to estimate the significance of multi-species trend. The indicator included all analyzed species except Common Redpoll *Carduelis flammea* and Common Crossbill *Loxia curvirostra*, because these species had very irruptive population dynamics due to their nomadic movements. In addition, during the non-breeding period redpolls widely use open habitats (Dement'ev & Gladkov 1954), which were not covered with the current study). The MSI algorithm does not support a base period of multiple years, so 2019 was used in this case. We assess the significance of the multi-species trend for the whole the study period as well for its first and second parts (16 years before/since 2004). To reveal which species contributed most to the indicator, we calculated its correlations with all population indices (Spearman rank correlation, *cor.test* function).

Results

Fig. 2 shows the average density and estimated size of studied populations for each forest subzone. Most of species analyzed were present in all forest subzones, though some of them were rare or absent on the northern- or southernmost extremes. We divide species into two groups based on their distribution: "northern", with highest population sizes in the middle taiga zone (eight species), and "southern", with highest values in south taiga or further south (nine species; Table 2).

In 1988–2019, seven of the 17 studied species had moderately decreasing trends, populations of nine were stable, and one species had uncertain trend (Table 2, Fig. 3). The species with the strongest declines were Coal Tit *Periparus ater* (Fig. 3h), Goldcrest *Regulus regulus* (Fig. 3c) and Willow Tit *Poecile montanus* (Fig. 3f).

In general, species associated mostly with coniferous or mixed forest decline more than habitat generalists or species preferring deciduous stands (Table 2). It was confirmed both by their trend values (Fig. 4; weighted Mann-Whitney test: χ^2 = 2.71, df = 15, p = 0.016) and higher proportion of significantly decreasing trends (66.7% vs. 27.2% for species not associated with conifer trees). We found no difference between general tendencies in "northern" and "southern" species groups (χ^2 = 0.52, df = 15, p = 0.610).

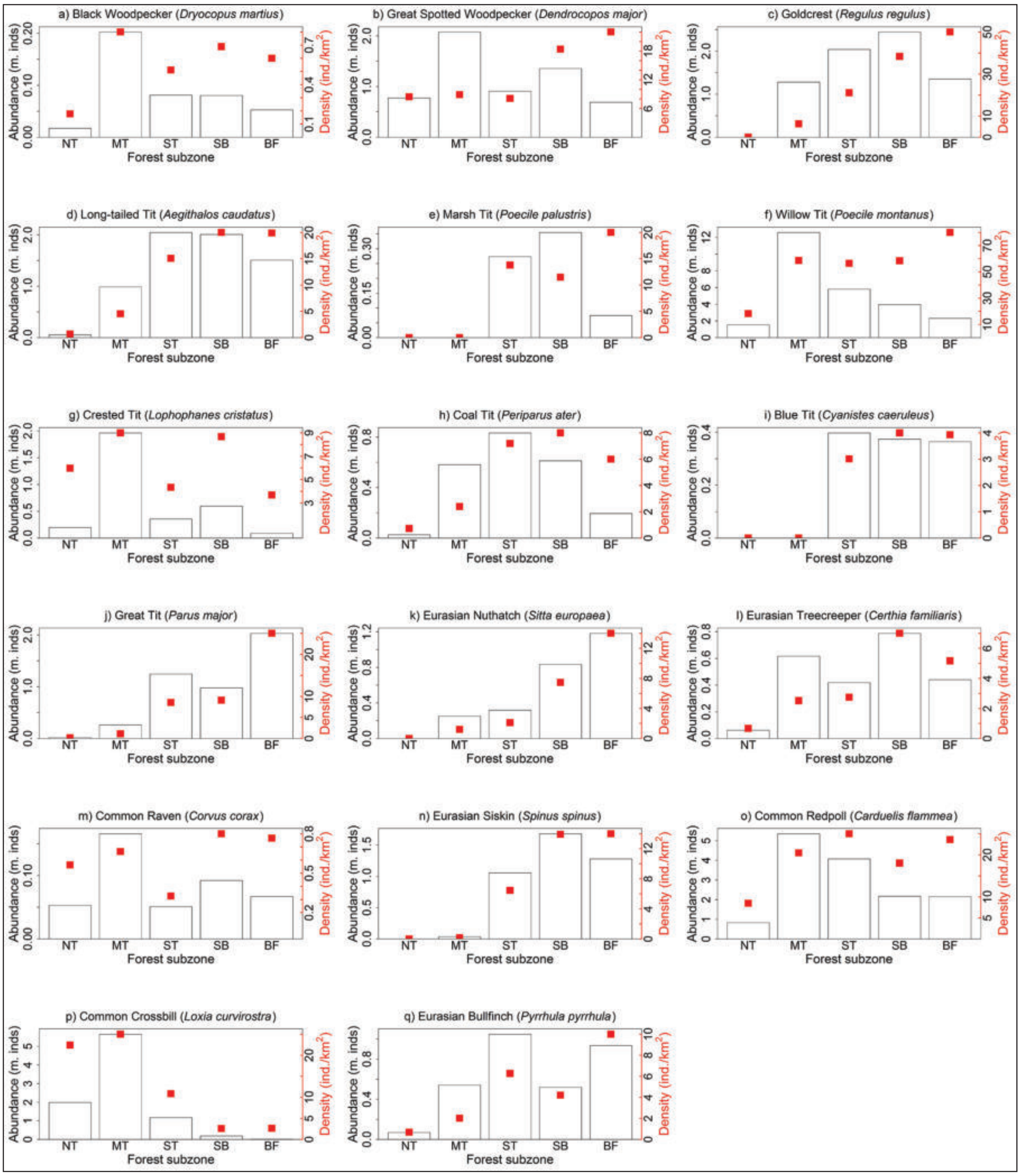

Figure 2. Average population density and size of 17 bird species (a–q) in preferred forest habitats for five subzones of European Russia forest belt during 1988–2019. Bars represents estimated total population size (ind.) and red dots show estimated mean density (ind./km^2). NT is Northern taiga, MT is middle taiga, ST is southern taiga, SB is subboreal forests and BF is broadleaf forests.

As negative tendencies, though not always significant, were demonstrated by the most of the studied species, the MSI for wintering forest birds showed a long-term moderate decline (Fig. 5). The highest correlation values for multi-species and population indices ($r_s \geq 0.70$, $p < 0.01$) were for Goldcrest *Regulus regulus*, Willow Tit *Poecile montanus* and Great Spotted Woodpecker *Dendrocopos major* (Table 2). Short-term MSI trends both before and after 2004 were insignificant and classified as stable, indicating that the most pronounced decline had place at the turn of these periods.

Discussion

In comparison with similar winter bird monitoring schemes in European countries (Heldbjerg

Table 2. Population trend parameters for common wintering birds by the PARUS monitoring program. FT — preferred forest type, the type of forests, whose area was used in trend calculation: A — all forests; C — coniferous and mixed forests; D — deciduous forests. DT — distribution type: N — "northern", S — "southern" (see Results). Abbreviations for trend classes (Bogaart *et al*. 2018): ↓ — moderate decrease, — stable, ? — uncertain. MAC (%) — mean annual changes of population indices, r_s — Spearman's rank correlation coefficient between species' population indices and the multispecies indicator (MSI); it is given for species included in the MSI calculation. Asterisks show parameters' statistical significance: * — p < 0.05, ** — p < 0.01.

Common name	Latin name	FT	DT	Multiplicative slope (±SE)	Trend class	MAC (%)	r_s
Black Woodpecker	*Dryocopus martius*	A	N	1.008 ± 0.009	—	+0.75	0,32
Great Spotted Woodpecker	*Dendrocopos major*	C	N	0.982 ± 0.005	↓**	–1.85	0,70**
Goldcrest	*Regulus regulus*	C	S	0.966 ± 0.009	↓*	–3.36	0,73**
Long–tailed Tit	*Aegithalos caudatus*	A	S	0.987 ± 0.008	—	–1.35	0,60**
Marsh Tit	*Poecile palustris*	D	S	0.986 ± 0.012	—	–1.43	0,38*
Willow Tit	*Poecile montanus*	C	N	0.968 ± 0.005	↓**	–3.21	0,71**
Crested Tit	*Lophophanes cristatus*	C	N	0.985 ± 0.009	—	–1.51	0,49**
Coal Tit	*Periparus ater*	C	S	0.966 ± 0.011	↓*	–3.41	0,58**
Blue Tit	*Cyanistes caeruleus*	A	S	1.001 ± 0.007	—	+0.09	0,05
Great Tit	*Parus major*	A	N	0.964 ± 0.006	↓**	–3.62	0,65**
Eurasian Nuthatch	*Sitta europaea*	A	S	0.977 ± 0.004	↓**	–2.29	0,51**
Eurasian Treecreeper	*Certhia familiaris*	A	S	0.989 ± 0.006	—	–1.10	0,34
Common Raven	*Corvus corax*	A	N	0.995 ± 0.008	—	–0.47	0,13
Eurasian Siskin	*Spinus spinus*	A	S	1.008 ± 0.017	—	+0.76	0,18
Common Redpoll1	*Carduelis flammea*	A	N	0.987 ± 0.010	—	–1.27	
Common Crossbill	*Loxia curvirostra*	C	N	0.957 ± 0.034	?	–4.31	
Eurasian Bullfinch	*Pyrrhula pyrrhula*	A	S	0.984 ± 0.007	↓*	–1.56	0,45**

[1] The data include registrations of Arctic Redpoll (*C. hornemanni*) which were much less abundant and usually impossible to identify.

et al. 2016), the monitoring network of PARUS program has much wider spatial coverage (large part of European Russia) but limited habitat representativeness and a lower density of survey routes. This means that only well-pronounced changes with similar vector in the most part of the population can be detected, and the assessments may be biased if the trends were different in unexplored regions or habitats. The latter was particularly important for species often using human settlements (Great Tit *Parus major*, Blue Tit *Cyanistes caeruleus*, and Eurasian Bullfinch *Pyrrhula pyrrhula*) or non-forest landscapes (Siskin *Spinus spinus*, Eurasian Bullfinch, Common Redpoll; Dement'ev & Gladkov 1954). For example, winter density of the Great and the Blue Tit in human settlements is usually much higher than in natural forests, so they may contribute substantially to the total abundance — despite the fact that human population density is low in most of the studied region. Because of this, we cannot be sure if the observed tendencies are relevant for the whole populations. However, for predominately forest-dwelling species such gaps in coverage are unlikely to distort the observed tendencies, which generally were driven by the most preferred and widespread habitat types.

Another source of bias was that the area of forest was assumed to be stable in our trend calculations. Because of this, we were only able to estimate bird population trends in relation to their density dynamics, without including effects of changes in forest area. The preciseness of estimations of forest area change was also questionable, as we lack detailed forest statistics data.

In addition, we are aware that our monitoring network is very sparse for such a large region, so it provides very rough estimations. However, it is hard to explain simultaneous tendencies in different parts of the region with specific local conditions only; such results suggest some wide-scale factors have played a role. Most of the census sites were situated on areas with low human impact, so population dynamics likely reflected large-scale changes, not local ones. Here, we make some general hypotheses about them.

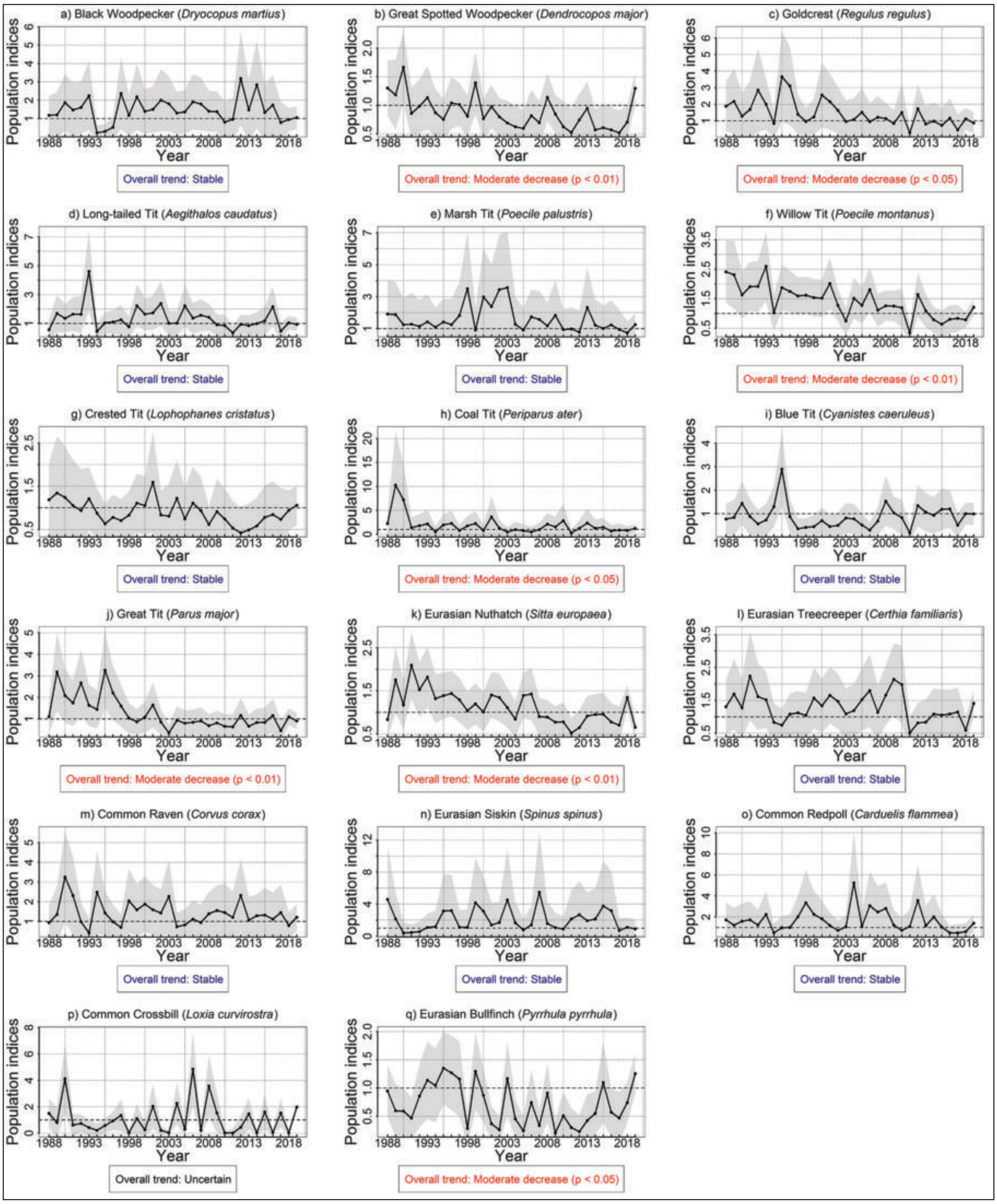

Figure 3. Winter population trends of 17 common wintering species (a–q) based on PARUS monitoring data in the European Russia forest zone. Grey area show 95% confidence intervals. Footnotes show trend classes (Bogaart *et al*. 2018) and significance.

The forest wintering species showed a general decline, particularly notable in early 2000s (Fig. 5), and none of species had significant positive tendencies (Table 2). The group of negative trends unites species with diverse ecology features such as habitat and feeding specialization, so there was probably more than one factor causing their dynamics. However, the decline of conifer forest specialists (see Table 2) was the most common and pronounced change in the bird community. The members of this group showed the lowest growth rates and had the largest impact on the total decline of the MSI. Among them were species with different latitudinal distribution, e.g.

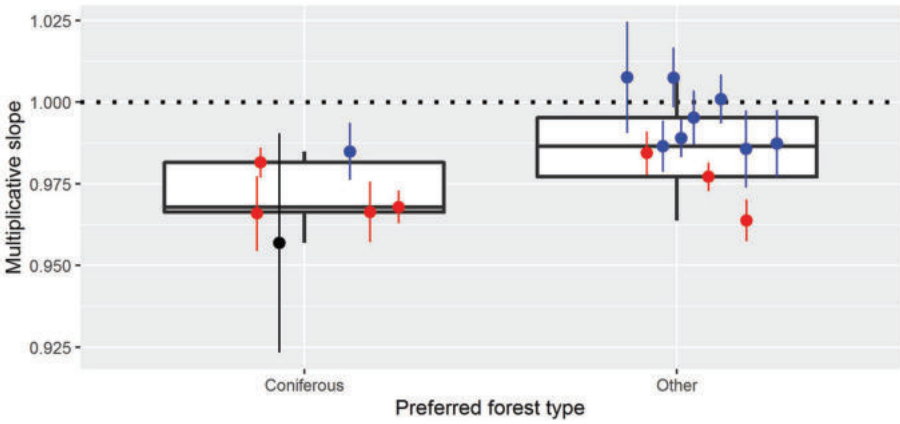

Figure 4. Population trend slope in two species groups of forest type preference during the winter (coniferous or other; see Table 2). "Boxes" represent group medians (central bar) and quartiles, weighed with the reversed standard errors of slope parameters; "whiskers" show total ranges. Species parameters are shown with dots, with bars representing its standard errors; dot colors correspond to trend class (red — moderate decrease, blue — stable, black — uncertain; see Table 2).

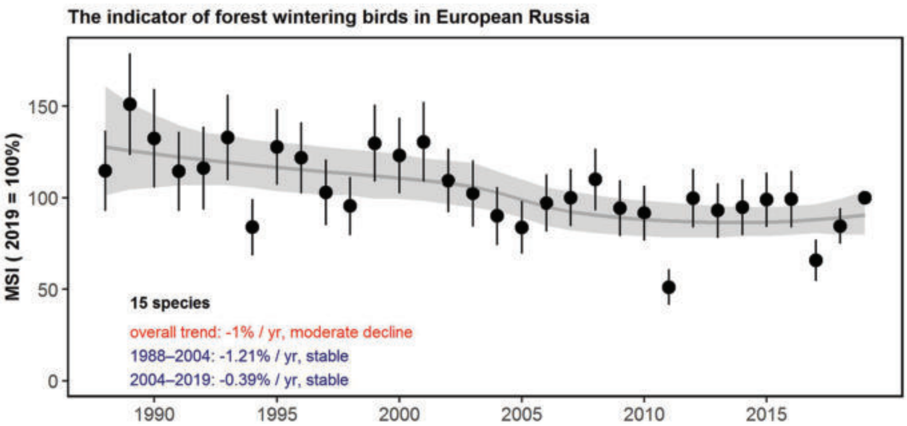

Figure 5. Multispecies indicator for 15 common wintering species in the forest zone of European Russia. Error bars show 95% confidence interval for year figures. The grey line and area show smoothed trend with its 95% confidence interval.

Great Spotted Woodpecker most numerous in the middle taiga zone (Fig 2b) and Goldcrest with the largest wintering population in subboreal forests (Fig. 2c). These species represent "northern" and "southern" groups (Table 2) and we found no difference between trend parameters for them. This suggests that habitat specialization, and not regional specificity, was the prevailing factor influenced on the species dynamics.

It seems likely that the specialists group suffered from decreasing of area and quality of coniferous stands. The main reasons for this are assumed to be intense logging (Gromtsev 2008), coupled with bark beetle outbreaks (Komarova 2015) and dieback of spruce stands in some regions. This has resulted in the changing of old coniferous forests to deciduous, mainly birch stands (Gromtsev 2008; Maslov *et al*. 2014). Even for species who do not predominately use coniferous forests during winter, such changes could affect breeding habitats (e.g. for Eurasian Bullfinch) or preferred habitats in other regions which can be sources of winter migrations to European Russia (e.g. Eurasian Nuthatch *Sitta europaea*, depending on cedar stands in Siberia; Dement'ev & Gladkov 1954).

Climate change could also play a role, possibly non-uniformly in different parts of the region. An analysis for Northwest Europe showed that northern areas are generally more prosperous in respect to wintering bird numbers than southern ones: the latter are more negatively affected by climate change (Lehikoinen *et al*. 2016). In severe climate conditions, wintering species can benefit from the rise of winter temperatures (Bourski 2009; Lehikoinen *et al*. 2016). However, in milder climates such increase can lead to adverse effects, e.g. winter thaws and subsequent frosting of foraging substrate. This can make access to prey items difficult for birds searching for small

Table 3. Trend classes for common wintering land bird species. Finland — Finnish mid-winter census scheme in 1957–2012 (Fraixedas *et al*. 2015), Estonia — Estonian mid-winter census scheme in 1987–2015 (Elts 2016), ER — European Russia (1988–2019, our results). Trend classes are abbreviated as follows: ↑ — moderate increase, ↑↑ — strong increase, ↓ — moderate decrease, — stable, ? — uncertain. Tendencies with the same sign as in our region are highlighted with bold, and with different signs with italic font. Cells are empty if the species' trend is not discussed in corresponding publication.

Common name	Latin name	Finland	Estonia	ER
Black Woodpecker	*Dryocopus martius*	↑	?	–
Great Spotted Woodpecker	*Dendrocopos major*	↑	↑	↓
Goldcrest	*Regulus regulus*	↓	–	↓
Long-tailed Tit	*Aegithalos caudatus*	↑	?	–
Marsh Tit	*Poecile palustris*		↓	–
Willow Tit	*Poecile montanus*	↓	↓	↓
Crested Tit	*Lophophanes cristatus*	↓	–	–
Coal Tit	*Periparus ater*	?	?	↓
Blue Tit	*Cyanistes caeruleus*	↑↑	–	–
Great Tit	*Parus major*	↑	–	↓
Eurasian Nuthatch	*Sitta europaea*		↑	↓
Eurasian Treecreeper	*Certhia familiaris*	–	–	–
Common Raven	*Corvus corax*	↑	↑	–
Eurasian Siskin	*Carduelis spinus*	↑	–	–
Common Redpoll	*Carduelis flammea*	–		–
Common Crossbill	*Loxia curvirostra*	↓		?
Eurasian Bullfinch	*Pyrrhula pyrrhula*	↓	↓	↓

invertebrates on tree bark, such as Long-tailed Tit *Aegithalos caudatus* (Fig. 3d), Treecreeper *Certhia familiaris* (Fig. 3l) and all Paridae species (Fig. 3e–j). Unusually high summer temperatures could also negatively influence invertebrate abundance and winter foraging resources; a prime example was extremely hot weather in European Russia in summer 2010 (Mokhov 2011). Subsequent depression of many passerine bird species (Preobrazhenskaya 2011; Zablotskaya 2015) were well reflected with our data on wintering populations (Fig. 5).

Given the constraints discussed above, we can make some comparisons with winter monitoring projects in neighbouring countries. The closest ones to our territory and most similar in their natural conditions are Finland (Fraixedas *et al*. 2015a) and Estonia (Elts 2016). In these countries, several species have tendencies of multi-year dynamics coinciding with ours (Table 3): there are six such species in Estonia and five in Finland, with two of them (Willow Tit and Eurasian Bullfinch) decreasing in all countries. In Finland, the decline of forest species populations, especially associated with late-succession coniferous forests, was shown both for wintering (Fraixedas *et al.* 2015a) and breeding populations (Fraixedas *et al.* 2015b); for wintering populations, these negative tendencies have been exacerbated since end of 1990s. The detailed analysis showed that the effect of climate change was relatively low in comparison to the intensification of forestry, resulted in decreasing of old-growth forest area. Both timing and direction of changes are similar to our results, and we assume its main reason was the same as well.

However, three species (Great Spotted Woodpecker, Eurasian Nuthatch and Great Tit) had opposite trend signs in different countries; it may be a question for further regional analysis whether the tendencies in adjacent parts of our study region also differed from general ones. An example of such analysis for Karelia (Yakovleva 2017) shows that this region, as well as Finland, had more positive tendencies that the European Russia in general (e.g. for Great Spotted Woodpecker, which showed a positive trend). Unfortunately, such studies are still scarce for our territory, and we need more data to unweave the importance of climate change and forestry effects on nest habitats quality, reproduction success, wintering conditions and migration patterns.

Acknowledgements

We wish to thank all volunteers involved in the PARUS monitoring program, who provide high-quality data for the current study.

References

Bogaart, P., Loo, M. van der & Pannekoek, J. 2020 [Online]. rtrim: Trends and Indices for Monitoring Data. R package version 2.0.6. Available https://CRAN.R-project.org/package=rtrim [02.10.20].

Bogolyubov, A.S. & Preobrazhenskaya, E.S. 2017. 30 years of wintering birds monitoring programs in Russia and neighboring regions. Land birds population dynamics. 30 years of wintering birds monitoring programs in Russia and neighboring regions. — Proceedings of All-Russian conference, ZBS MSU, 17–21 March 2017. IEE RAS, Moscow: KMK Scientific Press Ltd.: 54–64. [Боголюбов А.С., Преображенская Е.С. 2017. 30 лет программам мониторинга численности зимующих птиц России и сопредельных регионов. Динамика численности птиц в наземных ландшафтах. 30-летие программ мониторинга зимующих птиц России и сопредельных регионов. Материалы Всероссийской научной конференции, ЗБС МГУ, 17–21 Марта 2017 г. ИПЭЭ РАН, М.: Товарищество научных изданий КМК, 54–64].

Bourski, O.V. 2009. Influence of long-distant spatial connections on passerine birds population dynamics. — Doklady Akademii Nauk, 424 (3): 422–425. [Бурский О.В. 2009. Влияние дальних пространственных связей на динамику популяций воробьиных птиц. Доклады Академии Наук, 424 (3): 422–425].

Dement'ev, G.P. & Gladkov, N.A. (eds.) 1954. Birds of Soviet Union, Moscow: Sovetskaya nauka, 792 p. [Птицы Советского Союза, 1954. Дементьев Г.П., Гладков Н.А. (ред.). М.: Советская наука, 792 с.]

Elts, J. 2016. A review of 29 years of mainland winter bird counts in Estonia. — Technical report. Estonian Ornithological Society, Tartu. 22 p.

Fraixedas, S., Lehikoinen, A. & Lindén, A. 2015a. Impacts of climate and land-use change on wintering bird populations in Finland. — Journal of Avian Biology, 46 (1): 63–72.

Fraixedas, S., Lindén, A. & Lehikoinen, A., 2015b. Population trends of common breeding forest birds in southern Finland are consistent with trends in forest management and climate change. — Ornis Fennica, 46 (1): 63–72.

Gregory, R.D., Strien, A. van, Vorisek, P., Gmelig Meyling, A.W., Noble, D.G., Foppen, R.P.B. & Gibbons, D.W. 2005. Developing indicators for European birds. — Philosophical Transactions of the Royal Society B: Biological Sciences, 360 (1454): 269–288.

Gromtsev, A.N. 2008. The foundations of landscape ecology of European Russia taiga forests. KRC RAS, Petrozavodsk. P. 130–135. [Громцев А.Н. 2008. Основы ландшафтной экологии европейских таежных лесов России. КарНЦ РАН, Петрозаводск. С. 130–135].

Heldbjerg, H., Klvaňová, A., Anselin, A. 2015. The status of winter land bird monitoring in Europe. — Bird Census News, 29 (1–2): 3–8.

Komarova, I.A. 2015. Mass reproduction of the Bark beetle in 2010–2014 and protection of spruce stands. — Lesokhozyaystvennaya informatciya 3: 22–34. [Комарова И.А. 2015. Массовое размножение короеда-типографа в 2010–2014 гг. и защита еловых насаждений. Лесохозяйственная информация, 3: 22–34].

Koskimies, P. 1989. Birds as a tool in environmental monitoring. — Annales Zoologici Fennici, 26: 153–166.

Lehikoinen, A., Foppen, R.P.B., Heldbjerg, H., Lindström, Å., van Manen, W., Piirainen, S., van Turnhout, C.A.M., & Butchart, S.H.M. (2016). Large-scale climatic drivers of regional winter bird population trends. — Diversity and Distributions, 22: 1163–1173.

Ludecke, D. 2020 [Online]. sjstats: Statistical Functions for Regression Models (Version 0.18.0) [Online]. Available https://CRAN.R-project.org/package=sjstats [02.10.20].

Mokhov, I.I. 2011. Specific features of the 2010 summer heat formation in the European territory of Russia in the context of general climate changes and climate anomalies. Izvestiya AN, — Atmospheric and Oceanic Physics, 47 (6): 653–660.

Preobrazhenskaya, E.S. 2011. Wintering birds of East-European plane and Ural: unprecedented number depression in winter 2010/11. — Mir ptits, 39: 13–17. [Преображенская Е.С. 2011. Птицы, зимующие в лесах Восточно-Европейской равнины и Урала: небывалая депрессия численности в сезоне 2010/11 г. Мир Птиц 39: 13–17].

Preobrazhenskaya, E.S. 2017. Population dynamics of some common wintering birds in European Russia forests from 1980-s to 2010-s. Land birds population dynamics. 30 years of wintering birds monitoring programs in Russia and neighboring regions. — Proceedings of All-Russian conference, ZBS MSU, 17–21 March 2017. IEE RAS, Moscow: KMK Scientific Press Ltd.: 55–65. [Преображенская Е.С. 2017. Динамика численности некоторых массовых зимующих птиц в лесах Европейской России с 1980-х по 2010-е годы. Динамика Численности Птиц в Наземных Ландшафтах. 30-Летие Программ Мониторинга Зимующих Птиц России и Сопредельных Регионов. Материалы Всероссийской Научной Конференции, ЗБС МГУ, 17–21 Марта 2017 г. М.: ИПЭЭ РАН. С. 55–65].

R Core Team 2020 [Online]. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. Available https://www.R-project.org/ [02.10.20].

Ravkin, Yu.S. & Luk'yaniva, I.V., 1967. Geography of vertebrates in South taiga of West Siberia. Novosibirsk: Nauka. 183 p. [Равкин Ю.С., Лукьянова И.В. 1967. География позвоночных южной тайги Западной Сибири. Новосибирск: Наука. 183 с.].

Russian forest fund (by the census of the state forest fund on accounting by January 1, 2003). — A bulletin, 2003. Moscow: ARRISMF. 690 p. [Лесной фонд России (по данным государственного учета лесного фонда по состоянию на 1 января 2003 г.). Справочник, 2003. М.: ВНИИЛМ. 690 с.].

Shchepashchenko, D.G., Shvidenko, A.Z., Lesiv, M.Yu., Ontikov, P.V., Shchepashchenko, M.V. & Kraxner, F. 2015. The forest area in Russia and its dynamics based on a synthesis of remote sensing products. — Lesovedenie, 3: 163–171. [Щепащенко Д.Г., Швиденко А.З., Лесив М.Ю., Онтиков П.В., Щепащенко М.В., Кракснер Ф. 2015. Площадь лесов России и ее динамика на основе синтеза продуктов дистанционного зондирования. Лесоведение, 3: 163–171].

Soldaat, L.L., Pannekoek, J., Verweij, R.J.T., van Turnhout, C.A.M. & van Strien, A.J., 2017. A Monte Carlo method to account for sampling error in multi-species indicators. Ecological Indicators, 81: 340–347.

Statistics Netherlands, 2017. MSI-tool [Online]. Stat. Neth. Available https://www.cbs.nl/en-gb/society/nature-and-environment/indices-and-trends-trim-/msi-tool [02.10.20].

USSR forest fund (on accounting by January 1, 1988). A statistical bulletin, 1990. All-Unioin Research and Informational Center of Forest Resources, Moscow. 1005 p. [Лесной фонд СССР (по учету на 01 января 1988г.). Статистический сборник., 1990. ВНИИЦлесресурс, М. 1005 с.].

Yakovleva, M.V. 2017. Population dynamic of dendrophilic birds in «Kivach» natural reserve under climate warming. Land birds population dynamics. 30 years of wintering birds monitoring programs in Russia and neighboring regions. — Proceedings of All-Russian conference, ZBS MSU, 17–21 March 2017. IEE RAS, Moscow: KMK Scientific Press Ltd. P. 47–54. [Яковлева М.В. 2017. Тенденции численности дендрофильных видов птиц в заповеднике "Кивач" в условиях потепления климата: Динамика Численности Птиц в Наземных Ландшафтах. 30-летие Программ Мониторинга Зимующих Птиц России и Сопредельных Регионов. Материалы Всероссийской Научной Конференции, ЗБС МГУ, 17–21 Марта 2017 г. М.: ИПЭЭ РАН. С. 47–54].

Zablotskaya, M.M. 2015. Tendencies of recent years' changes in bird population of forest habitats of Prioksko-Terrasny natural reserve. — XIV International Ornithological conference of Northern Eurasia. I. Theses. Almaty: Menzbier Ornitological Society. P. 196–197. [Заблоцкая М.М. 2015. Тенденции изменений последних лет в населении птиц лесных биоценозов Приокско-Террасного заповедника. XIV Международная Орнитологическая Конференция Северной Евразии. I. Тезисы. Алматы: Мензбировское орнитологическое общество. С. 196–197].

Received: 2 December 2019
Accepted: 27 October 2020

Bird Census News 2020, 33/1–2: 14–19

European Goose Management Platform — an immediate and wide use of citizen science data in goose research and management

Henning Heldbjerg, Jesper Madsen

European Goose Management Platform Data Centre / Department of Bioscience
Kalø, Aarhus University, Grenåvej 14, DK-8410 Rønde, Denmark
hh@bios.au.dk, jm@bios.au.dk

Abstract. The AEWA European Goose Management Platform provides a mechanism for sustainable use and management of goose populations in Europe, based on various monitoring schemes. Most European countries are involved, especially in the northern and western parts. Updated population status reports are published annually and are used for immediate decision-making. The different monitoring activities provide important data for population modelling of the species/populations and thus reliable and updated information on population status, trends, and demographic parameters. A large number of volunteers are involved in different aspects of the monitoring.

Introduction

The European Goose Management Platform (EGMP) was established in 2016 and functions under the framework of the African-Eurasian Migratory Waterbird Agreement (AEWA). The goal of the EGMP is to provide a mechanism for a structured, coordinated and inclusive decision-making and implementation process for the sustainable use and management of goose populations in Europe (https://egmp.aewa.info/).

Most of the European goose populations are increasing. Foraging geese on cropland is a challenge for many farmers, in particular in north and west Europe (Fox et al. 2017, Fox & Madsen 2017). There is also a conflict between the increasing goose numbers and air traffic collision risks (Bradbeer et al. 2017). Some species are huntable, while others are protected, depending on national and international regulations. However, the large flocks of geese also attract attention from the public, witnessed by an increasing number of visitors at areas with high concentrations of staging or wintering goose. This has also resulted in an increase in the number of (colour)-ringed geese reported from various schemes on reporting portals such as www.geese.org. Hence, there is a lot of interest associated with this specific group of birds.

EGMP's main objective is to maintain goose populations at a favourable conservation status, taking into account concerns of relevant stakeholders as well as the pertinent legislative frameworks and regulations. To maintain a favourable conservation status it is crucial to have reliable information about the status and the trend for a given species. Thus, every available relevant dataset is included in the population monitoring of the species.

At present populations of four goose species, Pink-footed Goose *Anser brachyrhynchus*, Taiga Bean Goose *Anser fabalis fabalis*, Greylag Goose *Anser anser* and three populations of Barnacle Goose *Branta leucopsis* are included in the EGMP-work. To be able to manage the populations, some of these are further divided into Management Units (MUs) of reasonable sizes with coherent breeding areas, staging sites and wintering areas. The Taiga Bean Goose has been divided into four MUs, Greylag Goose two MUs and the Russian/Netherlands & Germany population of the Barnacle Goose three MUs, respectively. Altogether, 14 participating Range States and the European Commission are involved in the work, covering large parts of Europe (Fig. 1, Table 1).

These populations of Pink-footed Goose, Greylag Goose and Barnacle Goose have all increased significantly over the recent decades (Table 1), whereas a dramatic and range-wide decline in the population size of the Taiga Bean Goose has been recognized.

For all four species, species management plans or action plans have been produced (Madsen & Williams 2012, Marjakangas et al. 2015, Jensen et al.

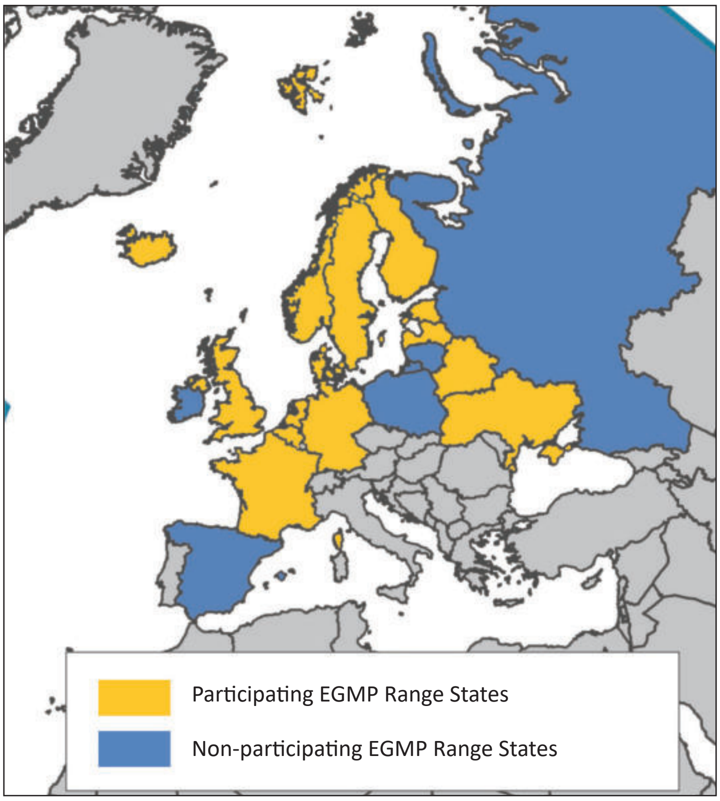

Figure 1. Map of the EGMP participating and non-participating Range States

Table 1. Overview of goose populations included in the work by the European Goose Monitoring Platform (EGMP).

Population	Breeding area	Staging/Wintering sites	Population size
Pink-footed Goose			
Svalbard population	Svalbard	Sweden, Norway, Finland, Denmark, The Netherlands, Belgium	1980s: 25,000–30,000 2019: 68,400–80,400
Taiga Bean Goose			
Western Management Unit	Norway, Sweden	NW-Denmark, Scotland, England	(2015): 1,500
Central Management Unit	N-Sweden, N- Norway, N-C Finland and NW Russia	Mostly in S-Sweden, SE Denmark and NE-Germany	Mid-1990s: 100,000 2019/2020: 75,200–80,700
Eastern 1 Management Unit	Russia	Mostly NE-Germany, and NW-Poland	(2015): 15,000
Eastern 2 Management Unit	Russia	SE-Kazakhstan, E-Kyrgyzstan and NW-China	(2015): 2,000–5000?
Greylag Goose			
NW/SW European population	Fenno-scandia, NW- Germany, The Netherlands, Belgium and N-France (2 MUs)	North and West Europe from S-Sweden to Belgium and Spain	1980s: 120,000–130,000 2018: 751,000
Barnacle Goose			
Russia/Germany & Netherlands population	Russian Arctic, in the Baltic Sea and North Sea areas (3 MUs)	Mostly Sweden, Denmark, Germany, The Netherlands and Germany	1980s: 50,000–200,000 2018: 1,4 million
East Greenland/Scotland & Ireland population	E-Greenland and Iceland	Iceland, Scotland and Ireland	1980s: c. 25,000–35,000 (winter) 2018: 72,200
Svalbard/South-west Scotland population	Svalbard	Norway, SW-Scotland	1980s: 10,000–12,000 2017: 41,700

Pink-footed Goose: Heldbjerg et al. (2020a).
Taiga Bean Goose: Marjekangas et al. (2015), Heldbjerg et al. (2020b).
Greylag Goose: Heldbjerg et al. (2020c).
Barnacle Goose: Russia/Germany & Netherlands population: Koffijberg (2020); Svalbard/South-west Scotland population: WWT Waterbird Monitoring (2020); Svalbard/South-west Scotland population: Jensen et al. (2018).

2018, Powolny et al. 2018). This has led to the development of Adaptive Flyway Management Programmes (AFMPs) for each species, however with a varying degree of implementation. The population status and harvest assessments for the huntable species are updated annually and published on EGMP's website (https://egmp.aewa.info/).

The European Goose Management International Working Group (IWG) serves as the main coordinating and decision-making body. It is composed of representatives of national governments, national experts, the European Union, observer organizations and other relevant stakeholders. The IWG meets annually to decide, at the multispecies level, on adjustments to the management frameworks, prioritization of plan processes as well as population specific harvest quotas and to exchange experiences.

A combination of wide use of citizen science and other specific studies

To understand the changes in population numbers, we need to know the current population size, the numbers added to this in the annual cycle (productivity of young) and the numbers removed from the population (natural mortality and 'offtake', which is the term used to describe the number of individuals removed from the environment through hunting or harvesting by humans). Since these species are exposed to harvest or derogation killing, the size and variation in the offtake plays a crucial role.

To describe the status, trends and demography for every species and MU, the EGMP uses several citizen science datasets. They rely on existing organised counts and use additional counts and specific data when needed (Table 2).

The long-term mid-winter counts run by Wetlands International provide the most valuable information about population size of a large number of species from many countries (Nagy & Langendoen 2020) and involve many keen ornithologists. However, for some of the goose populations, it became clear that there is an urgent need for more specific counts at other parts of the annual cycle. An example is the monitoring of the Central MU of Taiga Bean Goose that is counted in October, and again in early March when the majority of the birds are located in relatively limited areas of Sweden (see Table 1).

During autumn counts, ageing of individuals in flocks is possible from the distance, however preferably carried out by experienced ornithologists. The variation in annual productivity is often large; hence, it is an important parameter to include in the population modelling.

For Greylag Goose, evidence of breeding collected from Common Bird Monitoring schemes in several countries are included (Heldbjerg et al. 2020c). Although such data rarely provide much information on breeding numbers they have been proven to be useful to describe the trends for the national breeding populations. Traditionally, most goose populations are counted outside the breeding season when they occur in large flocks. However, this may be problematic when the origin of these birds is not known. If non-breeding staging areas include birds from several countries and MUs, it is preferable to include information from the breeding period to understand population changes in the different countries.

In some cases, there are no existing systematic counts, for instance foraging geese in agricultural areas and in such cases, casual records of geese from different bird record portals are included. Despite the lack of systematic counts, such portals are often useful since they include large numbers of records from a huge number of sites all year round.

In general, the four goose species discussed here are well studied and their migratory movements well known. The offtake from the populations represents a very important part of the total mortality. Hence, it is crucial to have reliable data on the offtake. Legal harvest seasons vary between species and countries and the countries involved manage reporting and maintain databases on the annual harvest in different ways. The format, reporting details, and quality varies between countries and regions. Derogation refers to the culling of geese in the non-hunting season in cases where there is no other satisfactory solution for the prevention of serious damage to crops or prevention of bird strikes. Data are reported annually to the EU in accordance with Article 9 of the European Birds Directive.

In most goose studies, ringing programs based on neck-rings or darvic tarsus rings are included. They show that for several species, the migratory behaviour and wintering ranges have changed considerably during recent decades. For example, Swedish Greylag Geese used to winter in Spain but have now shortened their mean migration distance and the major part of the population now stays in the Netherlands and Sweden (Nils-

Table 2. Overview of the existing and planned monitoring activities for the four goose species included in the work by the European Goose Monitoring Platform (EGMP). The four species are Pink-footed Goose (PfG), Taiga Bean Goose (TBG), Greylag Goose (GG) and Barnacle Goose (BG). (X) indicates that the activity is planned.

Species	PfG	TBG	GG	BG
Number of included populations	1	1	1	3
Number of MUs	1	4	2	3
Dedicated autumn counts	X	X		
Mid-winter counts		X	X	X
Dedicated spring counts	X	X		
Dedicated post-breeding counts			(X)	(X)
Common Bird Monitoring			X	
Casual records, Bird portals		X	X	X
Productivity — age counts	X	X	(X)	X
Survival — resightings	X	X	X	X
Harvest data	X	X	X	X
Derogation data	X	X	X	X
Weather information	X	X		
Crippling rate (from shotgun shooting)	X		(X)	(X)

son & Kampe-Persson 2018; Bacon et al. 2019). The Svalbard Pink-footed Geese used to migrate to wintering grounds in the Netherlands and Belgium; however, due to land use changes and milder winters, the majority of geese nowadays stay in Denmark throughout the winter (Clausen et al. 2018). These examples illustrate that monitoring activities need to be adapted according to the whereabouts of geese and that management decisions must be dynamic and drawn on recent information. Ring-readings by a huge network of volunteers as well as professionals provide highly valuable information, and online submission systems can provide immediate feedback of the life history of marked individuals, which is an important incentive for the observers to report.

In addition to this, tracking the movements of individual birds by using GPS-loggers enables us to use up-to-date knowledge on the movements and length of staging in different areas, information which is necessary to effectively protect or manage a population.

Survival of adult birds, i.e. the proportion of birds that survive from one year to the next, is estimated by resightings of neckbands and by recoveries of standard metal rings. Along with the capture of flocking geese, x-raying provides a measure of the number of geese crippled by carrying shot-gun pellets in their body tissue. By repeating x-raying and performing it at different sites, it is possible to study if there is a change in the crippling rate over time, between sites and between species.

Management and population modelling

In contrast to most other monitoring projects, where ideas, plans and use of the data develop over time, there is a planned and agreed use to all aspects of the EGMP goose monitoring and an immediate use in the conservation and management of the species. Here, ideas and plans may lead to additional monitoring activities. The availability and use of reliable data in combination with population modelling create the opportunity to understand and validate the importance of each parameter and thereby the expected impact at the population level when one or more parameters are changed. For huntable species, the most manageable parameter is obviously to change in offtake.

By using the data within the same annual cycle of the counts, it is possible to use data in an adaptive way where harvest management is based on the most recent data on population size, productivity and offtake. This is known as Adaptive Harvest Management, which is useful for several huntable species where there is a high degree of uncertainty in the understanding of the system, such as the drivers of population change.

In the EGMP, we have started to make use of Integrated Population Models (IPM) to predict the impacts of changes in the environment or management decisions on population sizes. It represents an advanced approach to modelling, in which all available demographic data, e.g. population counts, age ratios, survival estimates, are incorporated into a single analysis. IPMs have many advantages over traditional approaches to modelling, including the proper propagation of demographic uncertainty, better precision in the estimation of demographic rates and population size, the ability to handle missing data and to estimate latent (i.e., unobserved) variables and, the capacity to guide the development of effective monitoring programs (Johnson et al. 2020).

Ideally, the combination of precise data on the important demographic parameters and predictive models lead to management, which can be adapted on an annual basis. In the EGMP, emphasis is put on a transparent and open discussion, where all relevant stakeholders are involved in the decision-making and hopefully, over time it will involve an increasing number of participating EGMP Range States. Reliable data is a crucial backbone in the process. This illustrates the idiom that 'A chain is no stronger than its weakest link'. We are grateful for the joint effort from a large number of involved volunteers to make this chain as strong as possible.

References

Bacon, L., Madsen, J., Jensen, G. H., de Vries, L., Follestad, A., Koffijberg, K., Kruckenberg, H., Loonen, M. J. J. E., Månsson, J., Nilsson, L., Voslamber, B., & Guillemain, M. 2019. Spatio-temporal distribution of greylag goose *Anser anser* resightings on the north-west/south-west European flyway: guidance for the delineation of transboundary management units. Wildlife Biology, 1: 1–10. https://doi.org/10.2981/wlb.00533.

Bradbeer, D.R., Rosenquist, C., Christensen, T.K., & Fox, A.D. 2017. Crowded skies: Conflicts between expanding goose populations and aviation safety. Ambio, 46: 290–300.

Clausen, K.K., Madsen, J., Cottaar, F., Kuijken, E., Verscheure, C. 2018. Highly dynamic wintering strategies in migratory geese: coping with environmental change. Global Change Biology, 24 (7): 3214–3225. https://doi.org/10.1111/gcb.14061

Fox, A.D. & Madsen, J. 2017. Threatened species to super-abundance: The unexpected international implications of successful goose conservation. Ambio, 46: 179–187.

Fox, A.D., Elmberg, J., Tombre, I.M. & Hessel, R. 2017. Agriculture and herbivorous waterfowl: a review of the scientific basis for improved management. Biological Reviews, 92: 854–877.

Heldbjerg, H., J. Madsen, O. Amstrup, J. Bakken, T. Balsby, T. Christensen, et al. 2020a. Pink-footed Goose Population Status Report 2019–2020. AEWA EGMP document AEWA/EGMIWG/5.7.

Heldbjerg, H., Fox, A.D., Christensen, T.K., Clausen, P., Kampe-Persson, H., Koffijberg, K., Kostiushyn, V., Liljebäck, N., Mitchell, C., Nilsson, L., Rozenfeld, S., Skyllberg, U., & Alhainen, M. 2020b. Taiga Bean Goose Population Status Report 2019–2020. AEWA EGMP document AEWA/EGMIWG/5.10.

Heldbjerg, H., Jensen, G.H., Madsen, J., Koffijberg, K., Langendoen, T. & Nagy, S. 2020c. Greylag Goose Northwest/Southwest European population status report 2016–2019. AEWA EGMP document AEWA/EGMIWG/5.13.

Jensen, G.H., Madsen, J. & Nagy, S. (Compilers). 2018. AEWA International Species Management Plan for the Barnacle Goose (*Branta leucopsis*) — Russia/Germany & Netherlands population, East Greenland/Scotland & Ireland population, Svalbard/South-west Scotland population. AEWA Technical Series No. 70, Bonn, Germany.

Johnson, F.A., Zimmerman, G.S., Jensen, G.H., Clausen, K.K., Frederiksen, M. & Madsen, J. 2020. Using integrated population models for insights into monitoring programs: an application using pink-footed geese. Ecological Modelling, 415: Article 108869. https://doi.org/10.1016/j.ecolmodel.2019.108869

Johnson, F.A., Mäntyniemi S. & Heldbjerg, H. In prep. An Integrated Population Model for the Central Management Unit of Taiga Bean Geese. Final Project Report. AEWA report.

Koffijberg, K., Clausen, P., Devos, K., Haas, F., Isaksen, K., Heldbjerg, H., Madsen, J., Lehtinimie, T., Toivanen, T., Tombre, I. & Wahl, J. 2020. Barnacle Goose Russia/Germany & Netherlands population status report. AEWA/EGMIWG/5.17. Bonn: UNEP/AEWA Secretariat.

Madsen, J., & Williams, J.H. 2012. International species management plan for the Svalbard population of the Pink-footed Goose *Anser brachyrhynchus*. AEWA Technical Series. No. 48. Bonn, Germany.

Marjakangas, A., Alhainen, M., Fox, A. D., Heinicke, T., Madsen, J., Nilsson, L. & Rozenfeld, S. 2015. International Single Species Action Plan for the Conservation of the Taiga Bean Goose (*Anser fabalis fabalis*). AEWA Technical Series No. 56.

Nagy, S. & Langendoen, T. 2020. Flyway trend analyses based on data from the African-Eurasian Waterbird Census from the period of 1967–2018. Online publication. Wetlands International, Wageningen, The Netherlands. URL: http://iwc.wetlands.org/index.php/aewatrends8.

Nilsson, L. and Kampe-Persson, H. 2018. Changes in migration and wintering patterns of greylag geese *Anser anser* from southernmost Sweden during three decades. Ornis Svecica, 28: 19–38.

Powolny, T., Jensen, G.H., Nagy, S., Czajkowski, A., Fox, A.D., Lewis, M., Madsen, J. (Compilers). 2018. AEWA International Single Species Management Plan for the Greylag Goose (*Anser anser*) — Northwest/ Southwest European population. AEWA Technical Series No. 71. Bonn, Germany.

WWT Waterbird Monitoring 2020. https://monitoring.wwt.org.uk/our-work/goose-swan-monitoring-programme/species-accounts/greenland-barnacle-goose/ Accessed 4. November 2020.

Received 29.11.2020
Accepted 16.12.2020

EUROPEAN MONITORING NEWS

Introducing the EBCC board members

Aleksi Lehikoinen

Bird Census News has started a new article format, where it introduces current board members of the European Bird Census Council (EBCC). The articles cover interviews with the board members and the first issue is dedicated to two persons behind the recent breakthroughs in atlas projects: Verena Keller (EBBA2) and Mikhail Kalyakin (EBBA2, Russian Bird Atlas). Both Verena and Mikhail have been in the board of the EBCC since 2010.

Verena Keller. Kola Peninsula, Russia. 20.07.2016.
Photo by Niklaus Zbinden

What is your title and the current working position?

Dr. Verena Keller. Project Manager European Breeding Bird Atlas
Recently retired from Swiss Ornithological Institute, Sempach, Switzerland.

You have been the head of the Atlas Steering Committee for a long time (from the start). When did you first hear about option of conducting EBBA2 and what were your first thoughts then?

I was familiar with the first EBCC atlas from the time I started working at the Swiss Ornithological Institute in 1990 because my colleague Luc Schifferli was actively engaged in the EBCC board at the time. It was Luc who asked me to write the species text for Common Eider together with Martti Hario from Finland and I felt very honoured. I don’t remember when I first heard about the thoughts to make a new European atlas. The idea was already around when I was elected to the EBCC board at the conference in Caceres in 2010. The new board was very motivated but it was clear that the planning of the project could not fit into the regular tasks of the board. When I suggested creating a smaller working group, my board colleagues welcomed the idea and asked me to chair it.

Now after all these years, the book is finally ready. How do you feel now?

When we prepared the first project concept we proposed to publish the book in 2020, because of the biodiversity targets that were set for this year. Looking back I am still a bit surprised that we actually managed to keep this final deadline. Seeing the beautiful book now finished is very satisfying and a highlight at the end of my working career. I am also very proud of the EBBA2 coordination team. It is only the collaborative effort of the team, the steering committee and the whole network that made this possible.

Data collection of EBBA2 required massive amount of field work including capacity building in some parts of Europe and you participated also this personally in various locations. Could you tell to the readers some of the memorable moments?

I did most of the EBBA2 fieldwork together with my partner Niklaus Zbinden and there are many memorable events. Atlas work means visiting areas which you usually don't visit when travelling to foreign countries. We would never have driven up so many narrow roads to remote villages in the mountains of North Macedonia, where we were always welcomed by people who spoke German, Italian or French. On the Kola Peninsula in northern Russia we were warned to pay attention to brown bears but sadly we only came across fresh traces; mosquitoes and horseflies were much more of a nuisance. Being able to explore a very small part of the Kola Peninsula was very special for us and I remember in particular standing on top of a mountain and looking across the vast expanses of Taiga, mires and lakes all around us.

You have read the book probably already multiple times during the writing, revising and proof reading process, what were the largest surprises of the atlas results to you?

Probably the biggest surprise was the geographical coverage achieved in the end, much higher than what we initially hoped for. The changes in distribution were expected and it was maybe more surprising to see where changes were documented which differed from expectations. For me it was surprising, for instance, to see that on the Iberian Peninsula quite a number of species expanded their range towards the south. The amount of the spread of some coastal species to inland wetlands was also unexpected.

EBBA2 is not only about the book, but a larger development of bird monitoring. How do you see that EBBA2 has influenced European monitoring in general but also the working strategies in the EBCC. (Sorry pretty large question ☺)

The EBCC has always focused on the whole continent but with the geographical limitations of PECBMS and other initiatives there was still a bias towards the western part of the continent and politically to the European Union. EBBA2 has changed our angle of looking at Europe. The EBCC network has been strengthened in east and southeast Europe and we have to build up on this and think about ways to improve monitoring across the continent. This is a challenge because it is much more difficult to find resources for long-term projects than for a project like EBBA2 which is limited to a certain period.
EBBA2 and the initiatives that led to the EuroBirdPortal have changed our approach to running EBCC projects. PECBMS, EBBA2 and EBP are strongly anchored in the EBCC network and at European level in the same institutions. The close collaboration between the projects is an important step towards strengthening monitoring across Europe.

What is your favourite bird group or species and why?

I have always rather been a generalist. I started working on waterbirds because of the possibilities to study applied questions in relation to human activities in wetlands. I was always attracted to lakes and rivers, which was probably also a reason for my interest in waterbirds.

Mikhail Kalyakin. Greece, March 2017. Photo by Irina Kalyakina

What is your title and the current working position?

Dr. Mikhail Kalyakin
Director of the Zoological museum of the Lomonosov Moscow State University.

What are your main work duties?

Administration... The staff of the museum includes 100 people, and the activities of the museum are connected with three main aspects: collating and keeping zoological collections, using these collections in scientific and practical studies, and education by distributing biological knowledge for the general public. My role is to coordinate the staff in this work.

When did you start the Russian bird atlas work?

The work on the Atlas of breeding birds of the European Russia started immediately after decision to start the European atlas, adopted in Caceres, Spain, in the end of March 2010. We, the two co-coordinators (me and Olga Voltzit, a scientist from the Zoological museum) used the experience gained from the project "Atlas of birds of the Moscow City" (2006–2012, published in 2014).

The Russian bird atlas has been a great success story! What were your expectations in the beginning?

Our ambition was not that high. We have not got a large community of birdwatchers, but a huge area to cover, and we had no experience in running such huge project both in methodology and fundraising; in the first European bird Atlas (1997) the mapping of birds in European Russia was done just based on input from a few experts. We decided to estimate a minimal level of cover of the territory to aim for: 30%, or 600 squares of 50 by 50 km size. We believed that would be enough for a very general picture, which would encourage our ornithologists and volunteers into more active studies of bird distribution in future.

What are the reasons for the success?

I'm not sure that I can compile a full answer. In any case, there were a lot of elements which have formed a general puzzle steps by step... I will prepare a list of them and I need to outline that all elements were very important. I already told about our experience (and probably some authority) from 1999 onwards, when we started the citizen-science "Birds of Moscow City and the Moscow Region" project. There were no other ornithologists or ornithological societies who had idea to organize such work, so we had no competition in Russia around the question about leadership in the project. My administrative position helped us to have a freedom in our work, and position of Olga allowed her to dedicate a main part of her work time to the project. Several other staff members of the museum also took part in the project from time to time. On the other hand, we should not underestimate the existing level of knowledge about distribution of our birds: ornithology was developed in Russia for c. 200 years already including a high attention to faunistic studies. We have a number of active field-workers and research groups not only in Moscow or S.-Petersburg, experts in local bird communities and a large volume of the literature with data on bird distribution. And we have a considerable network of nature reserves, many with ornithologists amongst the staff. One of the key achievements during first years of the project was an agreement with the chief of our nature protection territories system, Vsevolod Stepanitsky, about the support for their participation from the Ministry of Nature Resources of the Russian Federation (not financial, but administrative). The next very important reason was our own readiness to try to find financial support for fieldwork (covering travel and sometimes food and equipment, if needed). Here I would like to mention the serious financial support from NGO Birds-Russia gained by Eugeny Siroechkovsky and Alexander Mischenko, this support was very important in the first two years of fieldwork (which started in 2011). And, of course, we can say about success of the Russian atlas project only in the context of the success of EBBA2: its Russian part was under constant attention of the EBCC Board and ASC, after that it was a big task of the work of the Atlas team formed by our perfect friends from ICO (Barcelona), CSO (Prague) and personally by its leader, Dr. Verena Keller. Our regular personal contact, our participation in workshops and conferences as well as a very kind methodological and just human support which we have got from our colleagues were also a critically important component of our united success. And we cannot omit the financial support which was organized by our colleagues in form of organization of grant proposals, financial support from several ornithological research organizations as well as a direct financial donations from a group of Catalan ornithologists (Sergi Herrando with colleagues), Swedish ornithologists (Åke Lindström with colleagues), Verena Keller, Niklaus Zbinden, Petr Voříšek and Mark Eaton. The main financial support both for fieldwork and for publication of the book was organized by the Atlas team as a series of grants provided by MAVA Foundation due to the key role of Nathalie Cadot.
And one more most important point is the activity and enthusiasm of the participants in fieldwork, data analysis, authors of species issues and other texts included in the atlas, editors and consultants.
And last, but not least (and may be the number one in the full list of reasons of the project's success) is the fantastic work of my co-coordinator, Olga Voltzit. There are not too much places where I can make this point but without her management of data, communication with participants (personal and sometimes very difficult) and with members of the ICO team the project would have been doomed to fail.

What were the biggest ornithological surprises of the atlas?

The question is rather difficult for me... On the one hand, there were several records of very rare "eastern" species as Shikra, Swinhoe's Snipe, Red-tailed Shrike found in "the Far East" of European Russia, or very selected breeding points very far from the main part of the species' range, as Crested Lark on Solovetskie Islands, White Sea. But for me, more interesting is the consequence of the almost full covering of our territory which allows us to see a real modern status of all species. Plus we have possibility to see the range of all our bird species across the whole of Europe, and it is fantastic! It is a series of pictures which we will enjoy and enjoy.

In addition to atlas work, common bird monitoring based on annual counts has started in Russia a couple of years ago and this BCN volume introduces the Russian monitoring program of wintering

landbirds, PARUS. How do you see the current development and the future of monitoring work in Russia?

Monitoring seems to be a logical continuation of the work on the atlas. We have received a modern picture of the distribution and an approximate estimate of the number of birds ("a snapshot"), now we need to monitor the changes. For the period until the next atlas is compiled, it would be logical to conduct regular monitoring of the number of birds (and therefore changes in their distribution). Unfortunately, it is a more difficult question than the question about atlas works… When you ask people to take part in an atlas you can say about the purpose which is not far, not behind the horizon. It is a sort of short concentration on the special topic. In monitoring you personally will see more or less significant result only after a long time period plus this result will be interesting and important only if your efforts are supported by the same activity of many other participants. For us as coordinators it is constant problem: how do we inspire observers to take part in regular work using a standard method? I would like to address this question to our colleagues in European countries, especially from Eastern Europe. During atlas works we used some financial support, not just the enthusiasm of ornithologists and volunteers, and it seems to me that we will need to do the same for a monitoring program for our huge territory. It is also important to point out two aspects of the problem of implementing such monitoring. Firstly, it should be organized almost absolutely independent, regardless of the administration, local or federal (Russia is out of EU, as we know). Secondly, and it is of course connected to the first point, when our European colleagues find declines in bird populations they have mechanisms for informing their state structures about it and for finding ways for positive changes, i.e. in farming practice. If you say "Oh, we also have here some problems" I will answer that this is incomparable with the level of such problems in countries from the former USSR. There are possibilities for influencing land-use practices in EU countries, but in our situation we have not such sorts of feedback… and of course we must remember about the size of our territory. It is almost 40% of the area of Europe, so the only way which we see for establishing and developing a monitoring scheme is through fundraising (fundraising for the long time!) plus working with official structures (the Ministry of Natural Resources) for improving the state's standard of monitoring of natural resources. It still does not know about such resources as birds, really! And is not interested in them. It is a new challenge, and we are working on it.
Sorry, you asked about PARUS and other monitoring schemes already established in Russia. In fact, we have several such systems oriented on different objects (territories and groups of birds), different longevity, etc. But all these schemes are based on enthusiasm of their leaders, they are not coordinated at local or county level and only some of them have any administrative or financial support.
Sorry for long answer, you see that this question is interesting, difficult, but we hope to solve it.

What is your favourite bird group or species and why?

Oh, one more difficult question. The object of your study usually will be your favourite group, and in my list I have such "small and shy brown birds" as reed-warblers, grasshopper warblers and Timaliid birds as well as bulbuls which were the object of my studies in Vietnam forests during several years. But my ornithological appetites include also birds of the White Sea, birds of Moscow and Moscow Region and forest birds of Vietnam – too much!

Introducing online tools to give feedback to the volunteers, volume 1: Finnish winter bird census scheme

Aleksi Lehikoinen

Keeping volunteers motivated and happy is a key aspect in long-term monitoring schemes using citizen science. Regular feedback is an important way to increase the motivation of the volunteers. The feedback can include published reports, meetings with presentations, but also online tools where volunteers can look at a variety of scheme results for themselves. Technical advances have enabled various online feedback options. The aim of this Bird Census News article series is to introduce various national versions of these online feedback systems, which hopefully can help national coordinators to develop their own systems. In addition, the articles will provide brief introductions to a range of bird monitoring schemes and also enable the reader to explore potential changes in bird populations in various areas.

The first article is introducing the Finnish winter bird scheme, which is coordinated by Finnish Museum of Natural History, University of Helsinki together with BirdLife Finland. The scheme has a long tradition: the first surveys were conducted in December 1956. Since then approximately 500 routes have been surveyed annually and the scheme is even more popular than breeding bird surveys in Finland. The scheme has expanded to cover three surveys during the winter season: in early November, end of December – early January and end of February – early March.

There has been an online system for entering data for more than ten years, but traditional paper forms are also accepted (covering <20% of the reports). The latest version of the online portal, which has been built under the Finnish Biodiversity Information Facility (FinBIF), has been running for five years. During this period there has been an online feedback page, which provides several options for displaying statistics from the surveys. These are explained in figures 1–4. The web-tool is found at https://laji.fi/en/project/MHL.3/stats?tab=species. The pages have Finnish, Swedish and English versions, but not all the texts have been translated into English yet.

The online tool is automatically updated after the volunteers have entered their observations to the system. This means that there are likely to be mistakes and typos, especially in the freshly entered data. We have emphasized on the front page of the online tool that the results of the surveys should not be interpreted as official survey results, but they are intended for visualising the data. For instance, the trend analyses (Fig. 3) do not deal with spatio-temporal variation in survey sites, which is accounted for in the official trend analyses.

Another important aspect is how data on sensitive species is handled. The route- and survey-specific results do not show the most sensitive species, where for instance disturbance by birdwatchers and photographers could affect overwintering chances of birds. In the species section, the abundance of species are only shown at 10 km × 10 km resolution (Fig. 2) and the trend information does not include detailed spatial information (Fig. 3). Volunteers are often concerned about the display of data for sensitive species, which is why removal of detailed observations from public display is also an important factor to please the volunteers.

Overall, the online tool has received positive feedback from the volunteers. When volunteers are looking at their own survey results, they can easily spot typing mistakes or notice that they have not necessarily entered their data from a certain year, for example. All these checks help to improve the quality of the data. The tool is also a good way to advertise the availability of data for researchers to increase the use of the data.

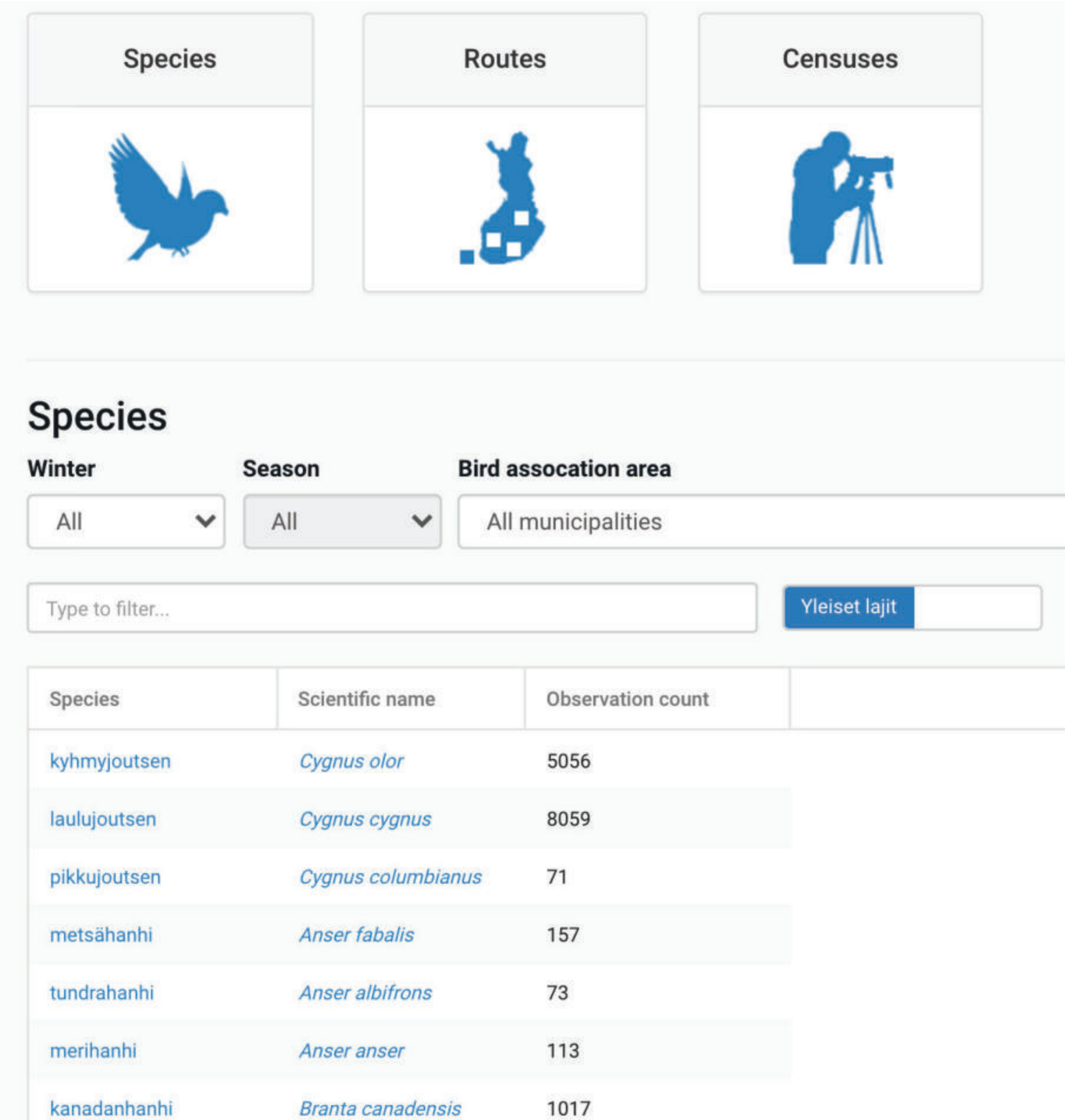

Fig. 1. The online feedback pages (https://laji.fi/en/project/MHL.3/stats?tab=species) have three main options for how to explore the reported data: i) Species, ii) Routes and iii) Census information. In the opening page people can select a species to see species-specific statistics. It is also possible to select a smaller geographical area based on local bird association areas or look at a particular year. The species list currently includes Finnish and scientific names of species and number of records of each species. The (i) species examples are presented in Figs 2 and 3 and (ii) route-specific example is presented in Fig. 4. In the (iii) census section it is possible to look at results of single census surveys.

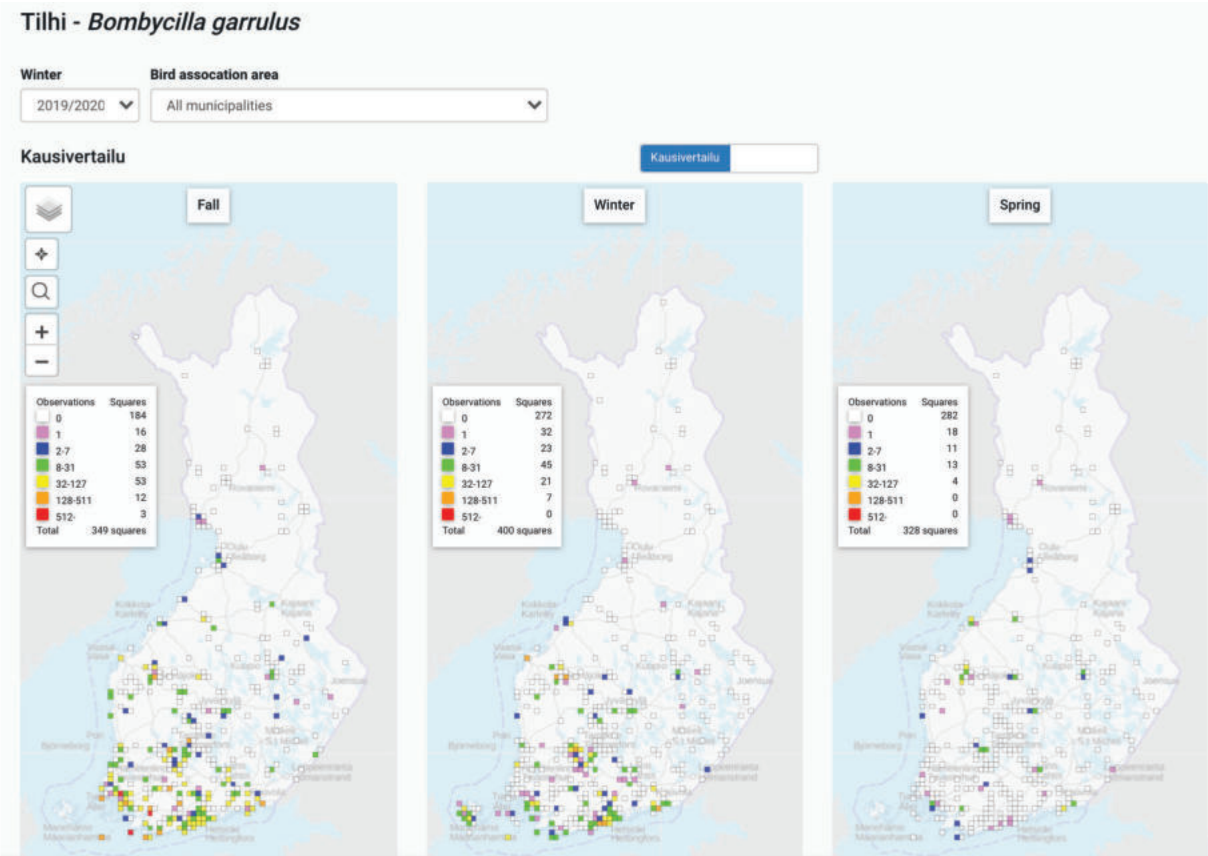

Fig. 2. In the species section, it is possible to explore the spatial distributions of abundances, but also the locations of the survey sites in 10 km x 10 km grids during the survey periods. This figure shows abundance of Bohemian Waxwing *Bombycilla garrulus* during three different census periods (Fall = November, Winter = December/January, Spring = February/March) during winter season 2019/2020.

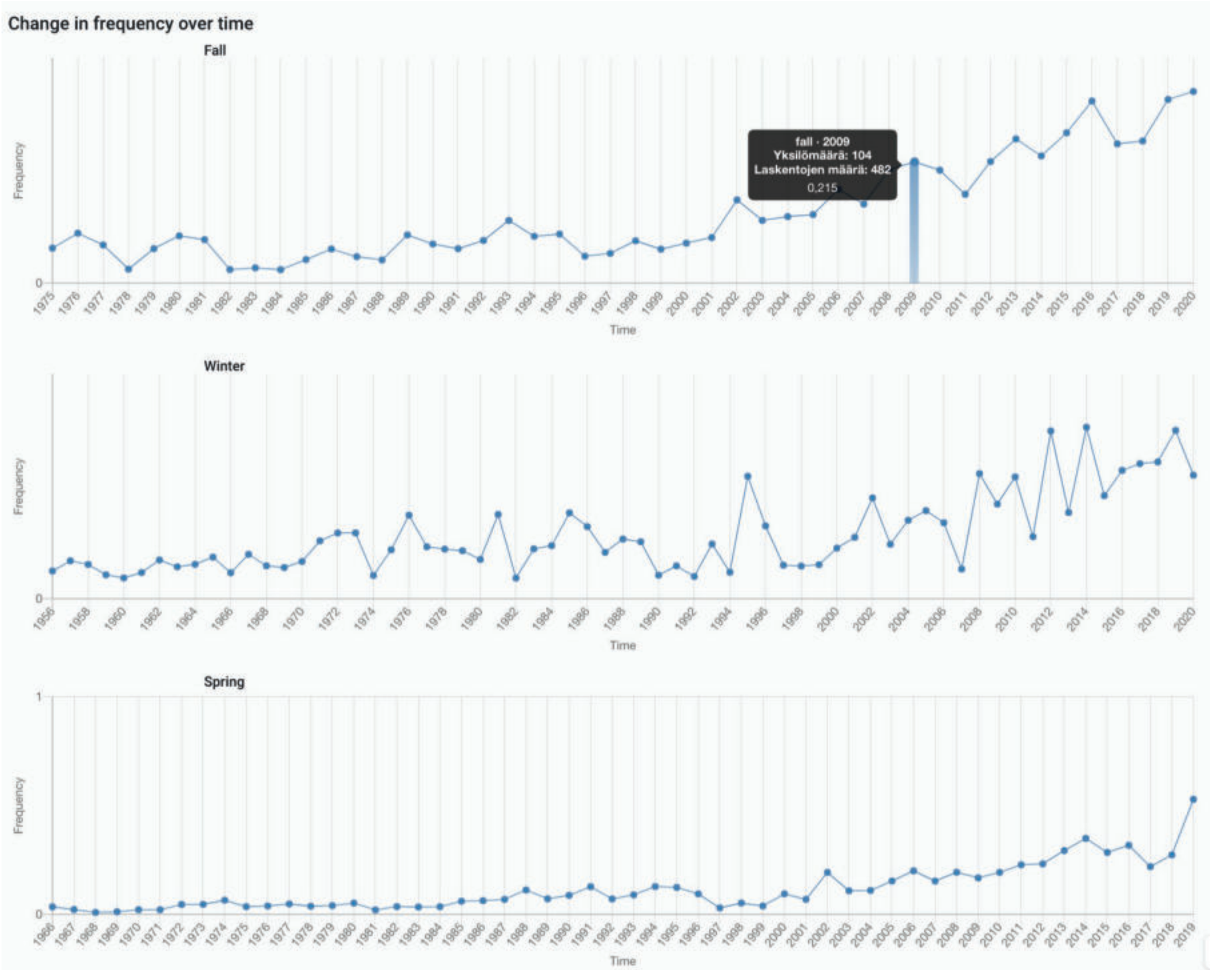

Fig. 3. The species section enables users to investigate long-term changes and variation in in species population numbers. This example shows the annual abundances of Grey-headed Woodpecker *Picus canus* during the three survey periods (Fall = November, Winter = December/January, Spring = February/March). The scale of the y-axis is abundance of birds per survey route, which are relative low in this species. However, due to rather large survey effort we can see a clear increase in abundance during the last 20 years. When moving a cursor above each point, it is possible to see how many routes have been surveyed and how many birds have been seen during that particular year. Grey-headed Woodpeckers are pretty secretive during breeding season, so actually winter bird surveys are currently documenting the Finnish population trend of the species better than breeding bird surveys.

Raasepori, Tammisaari Kaupunki, 1141 (665:330) - Winter

Taulukko havaituista lajeista

Fall Winter Spring

Punainen tausta: lintuja ainakin 50 % vähemmän kuin keskimäärin (lasketaan vain lajeille, joita keskimäärin ainakin 5 yksilöä);
vihreä tausta: lintuja ainakin 100 % enemmän kuin keskimäärin; vihreä numero: ennätys; punainen numero: vähyysennätys.

Download results

Species	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	KA	Med
kyhmyjoutsen	6	0	27	0	31	9	7	0	43	22	9.6	4.5
laulujoutsen	8	0	3	0	21	0	12	0	5	2	2.8	0
alli	0	0	1	0	0	0	0	0	0	0	0.1	0
mustalintu	0	0	0	0	0	0	0	0	0	1	0.1	0
telkkä	8	3	33	0	23	110	12	0	23	38	15.4	5.5
uivelo	0	0	19	0	0	0	0	0	0	17	2	0
isokoskelo	83	2	134	2	112	321	148	3	205	366	95.6	23.5
punasotka	0	0	0	0	15	0	0	0	0	0	0.8	0
tukkasotka	306	0	463	0	353	200	1444	0	244	1186	233.2	0

Fig. 4. In the route section, it is possible to select a single route and investigate annual changes in species abundances on that route during certain survey period. Here is an example of one route in Raasepori city in southwest Finland during the December-January census period. The species names in Finnish are presented in rows and years in columns. Numbers that are lower or higher than the average count are highlighted in pink and light green respectively.

Your text in the next issue?

Bird Census is meant as a forum for everybody involved in bird census, monitoring and atlas studies. Therefore we invite you to use it for publishing articles and short reviews on your own activities within this field such as (preliminary) results of a regional or national atlas or a monitoring scheme, species-specific inventories, reviews or activity news of your country (as a delegate: see also below).

Instructions to authors

– Text in MS-Word.
– Author name should be with full first name. Add address and email address.
– Add short abstract (max 100 words).
– Figures, pictures and tables should not be incorporated in the text but attached as separate files.
– Provide illustrations and figures both in colour.
– The length of the papers is not fixed but should preferably not exceed more than 15 pages A4 (including tables and figures), font size 12 pt, line spacing single (figures and tables included).
– Authors will receive proofs that must be corrected and returned as soon as possible.
– Authors will receive a pdf-file of their paper.
– References in the text: Aunins (2009), Barova (1990a, 2003), Gregory & Foppen (1999), Flade et al. (2006), (Chylarecki 2008), (Buckland, Anderson & Laake 2001).
– References in the list: Gregory, R.D. & Greenwood, J.J.D. (2008). Counting common birds. In: A Best Practice Guide for Wild Bird Monitoring Schemes (eds. P. Voříšek, A. Klvaňová, S. Wotton & R.D. Gregory), CSO/RSPB, Czech Republic; Herrando, S., Brotons, L., Estrada, J. & V, Pedrocchi, V. 2008. The Catalan Common bird survey (SOCC): a tool to estimate species population numbers. Revista Catalana d'Ornitología, 24: 138–146.

Send contributions in digital format by email to: aleksi.lehikoinen@helsinki.fi