

Mammal counts in the Breeding Bird Survey in Poland

Tomasz Chodkiewicz^{1,2}, Przemysław Chylarecki¹, Łukasz Wardecki², Lechośław Kuczynski³

¹ Museum & Institute of Zoology, Polish Academy of Sciences, Warszawa, Poland

² Polish Society for the Protection of Birds (OTOP), Marki, Poland

³ Adam Mickiewicz University, Poznan, Poland

Corresponding author Tomasz Chodkiewicz: tomasz.chodkiewicz@otop.org.pl

Well-planned citizen science projects are a source of valuable scientific data, and an already existing, well-functioning network of observers can be used to collect additional data. That is what is happening in the UK, which has perhaps the largest Breeding Bird Survey in Europe, with almost 3,000 volunteers. In addition to birds, mammals can be counted there as an option, as can butterflies in additional summer visits. In Poland, within our common breeding bird monitoring project, we also have an option to count mammals. The long time series we collected already has encouraged us to share some of the results.

The Breeding Bird Survey in Poland (MPPL) has been carried out since 2000. The programme is based on counts of all bird species seen or heard in randomly selected 1 km × 1 km sampling plots. The counts are carried out by enthusiastic volunteers, who make 2 transects of 1 km length in each plot (about 500 m apart). The observers carry out 2 surveys per breeding season: in early spring (10 April – 15 May) and in late spring (15 May – 30 June). The data obtained allow us to calculate precise trends in the abundance of 110 bird species (Wardecki et al. 2021).

Since 2005, our observers have been given the opportunity to record observations of mammals. We ask them to count all the individuals they see, but not to register tracks or field signs (e.g. mole hills). We don't want anyone to spend more time counting mammals at the expense of collecting bird data. The simple methodology has made observers very enthusiastic about counting mammals. In the first year of the survey, their presence was recorded in 76% of the surveyed plots, while in the next two years this proportion gradually increased and from the fourth year of the mammal survey to the present day it has been around 90% of the surveyed plots.

A total of 113 species of mammals occur in Poland (IOP 2023), but only 41 of them can be eas-

ily recorded. The others are marine mammals, bats, or small mammals of the orders Rodentia and Soricomorpha. Some of the 41 detectable species are difficult to identify, such as the West European Hedgehog *Erinaceus europaeus* and Northern White-breasted Hedgehog *E. roumanicus*, or the Pine Marten *Martes martes* and the House Marten *M. foina*, and are therefore these species pairs are treated as a single taxon in our data. Others are quite rare, like a newcomer to Poland, the Golden Jackal *Canis aureus* or are inconspicuous, such as the Wildcat *Felis silvestris*. In addition, the MPPL collects information on the presence of two species of domestic mammals that roam freely in the wild: the Feral/Stray Cat *Felis catus* and the Feral/Stray Dog *Canis lupus familiaris*.

In total, 26 taxa were detected in MPPL throughout the study period (Table 1). The most common mammal species with prevalence between 9 and 59% were Roe Deer *Capreolus capreolus*, European Hare *Lepus europaeus*, Feral/Stray Cat, Red Fox *Vulpes vulpes* and Feral/Stray Dog. Other mammals with prevalence between 1 and 7% include Red Deer *Cervus elaphus*, Red Squirrel *Sciurus vulgaris*, Wild Boar *Sus scrofa* and both species of marten. The next 17 species were the least common with a prevalence below 1%. The least common mammal was the European Bison *Bison bonasus* with only one observation (Table 1).

The data obtained make it possible to calculate indices and trends of change in the abundance of the most common species. Preliminary analyses were carried out for the ten most common species. They showed that the populations of three species of deer are increasing: Roe Deer (Fig. 1), Red Deer (both of which are hunted in Poland) and Moose. On the other hand, the only mammals that are clearly declining are the Feral/stray Dog (Fig. 2) and martens (Pine & House marten).

Table 1. List of mammal species recorded in MPPL in Poland, 2005–2021.

| | English name | Scientific name | Prevalence (%) |
|----|--|--|----------------|
| 1 | Roe Deer | <i>Capreolus capreolus</i> | 58.88 |
| 2 | European Hare | <i>Lepus europaeus</i> | 37.92 |
| 3 | Feral/Stray Cat | <i>Felis catus</i> | 17.60 |
| 4 | Red Fox | <i>Vulpes vulpes</i> | 10.08 |
| 5 | Feral/stray Dog | <i>Canis lupus familiaris</i> | 9.82 |
| 6 | Red Deer | <i>Cervus elaphus</i> | 6.60 |
| 7 | Red Squirrel | <i>Sciurus vulgaris</i> | 5.50 |
| 8 | Wild Boar | <i>Sus scrofa</i> | 3.90 |
| 9 | Pine Marten & House Marten | <i>Martes martes & M. foina</i> | 1.09 |
| 10 | Moose | <i>Alces alces</i> | 0.94 |
| 11 | European Beaver | <i>Castor fiber</i> | 0.53 |
| 12 | European Mole | <i>Talpa europaea</i> | 0.49 |
| 13 | European Badger | <i>Meles meles</i> | 0.39 |
| 14 | European Fallow Deer | <i>Dama dama</i> | 0.32 |
| 15 | West European & Northern White-breasted Hedgehog | <i>Erinaceus europaeus & E. roumanicus</i> | 0.28 |
| 16 | Least Weasel | <i>Mustela nivalis</i> | 0.28 |
| 17 | European Hamster | <i>Cricetus cricetus</i> | 0.25 |
| 18 | Raccoon Dog | <i>Nyctereutes procyonoides</i> | 0.21 |
| 19 | European Rabbit | <i>Oryctolagus cuniculus</i> | 0.18 |
| 20 | Wolf | <i>Canis lupus</i> | 0.12 |
| 21 | European Polecat | <i>Mustela putorius</i> | 0.10 |
| 22 | Eurasian Otter | <i>Lutra lutra</i> | 0.06 |
| 23 | Stoat | <i>Mustela erminea</i> | 0.06 |
| 24 | Common Muskrat | <i>Ondatra zibethicus</i> | 0.06 |
| 25 | American Mink | <i>Neovison vison</i> | 0.04 |
| 26 | European Bison | <i>Bison bonasus</i> | 0.01 |

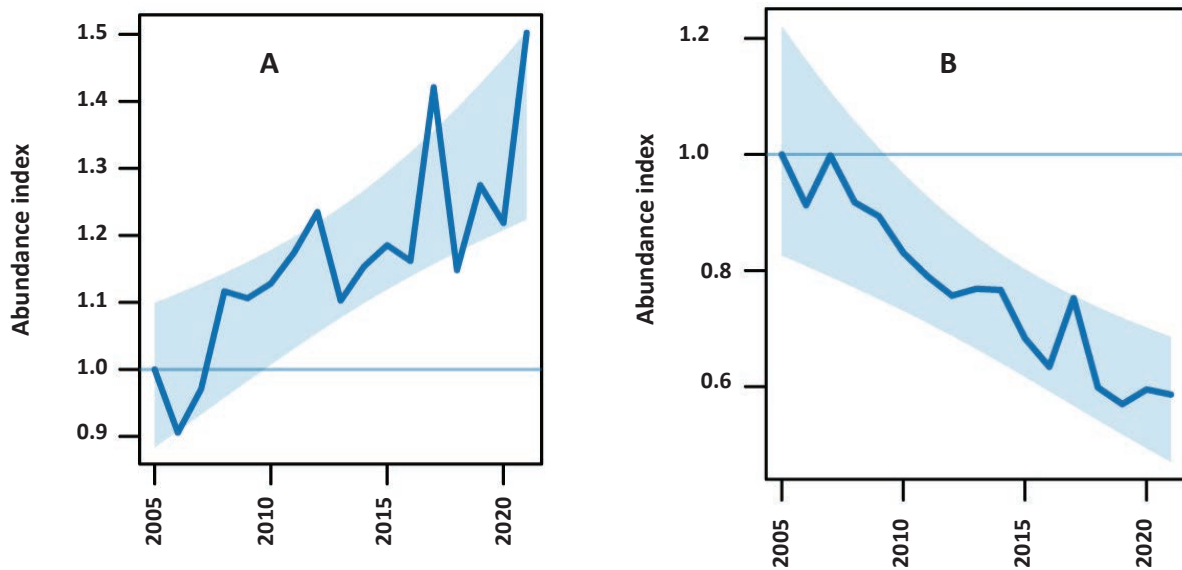


Fig. 1. Changes in the abundance indices of two mammal species: Roe Deer *Capreolus capreolus* (left panel) and Feral/Stray Dog *Canis lupus familiaris* (right panel) according to Breeding Bird Survey (MPPL) data collected in Poland, 2005–2021.

The data collected allow us to estimate changes in the abundance of the most common mammals in Poland. For the most part, these are animals subject to hunting exploitation, whose abundance and temporal changes in the country are parallelly estimated by hunters and foresters based on the so-called year-round observations and hunting bags (Zalewski et al. 2018). The MPPL results are therefore a good source of comparison for these data, collected by an independent group of observers. An additional value of the mammal data collected during bird monitoring is the infor-

mation on abundance and changes in the numbers of two free-ranging, domestic animals, Feral/Stray Cats and Dogs, which have a significant, often spectacular, impact on wild bird populations (Krauze-Gryz *et al.* 2019). The information that Feral/Stray Cats were present at least in one in six survey squares was particularly disturbing.

In conclusion, we hope that the selection of data presented here, coming from bird monitoring carried out in Poland will show that it is worth to consider extending fieldwork protocols to include mammal observations.

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