Quantifying bird dispersal in the Netherlands

Background

Birds can play a large role in the spread of infectious diseases, because of their movements within and between countries, both over short and long distances. Usutu virus and West Nile virus are mosquito-borne diseases that have recently emerged in the Netherlands. Especially blackbirds are affected by Usutu virus, and their population size has significantly declined since the first cases were observed in 2016.

Within OneHealthPACT (https://www.onehealthpact.org/) we are working on a metapopulation model to simulate mosquito-borne disease transmission in the Netherlands. Estimates of within-country movement of birds form an important component of this model as this dispersal contributes to the spread of diseases.

Goals of the project

To estimate the dispersal ranges of blackbirds within the Netherlands. This may vary by age of the bird and time of year. We will conduct this analysis for blackbirds in the first instance, and possibly use the same framework to be applied to other bird species.

Two datasets can be used for this

- Recoveries of ringed dead blackbirds.

Dead birds are reported to Sovon/DWHC by citizens. A proportion of these birds are ringed, providing information about their original location. Most dead ringed birds are reported directly to Vogeltrekstation. Over the past 10 years, around 1300 dead ringed blackbirds have been reported. The distance between the locations where birds were ringed and where they were recovered dead provides information about their dispersal distance.

- Live bird catching

Active bird catching and ringing is done by c. 580 mainly volunteer bird ringers at a large number of locations. During the breeding season, highly standardized ringing and recapturing is done at about 45 locations. Over the past 10 years, about 110.000 blackbirds have been ringed, and there have been around 26,000 live recaptures of ringed blackbirds. The distance between the locations where birds were ringed and where they were recaptured also provides information about their dispersal distance.

You will analyse dispersal using both datatypes, taking spatial and temporarl variation and sources of bias into account.

Where:

NIOO-KNAW / WUR-QVE

We are looking for an MSc student interested in bird ecology and ecological modelling. Experience with R (or similar software) and analysing complex datasets is required.

Relevant literature

Modelling unbiased dispersal kernels over continuous space by accounting for spatial heterogeneity in marking and observation efforts
https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/2041-210X.12872

Measuring dispersal as distance-dependent recruitment rates: testing the performance of DDRR on simulated data
https://link.springer.com/article/10.1007/s10336-010-0637-2