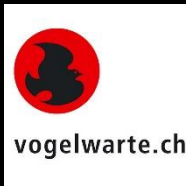


# The value of contextual data to contaminant studies – Tawny Owl proof of concept example

Virtual Short-term Scientific Mission in WG4



Urška Ratajč (SI), Rui Lourenço (PT), Al Vrezec (SI), Chris Wernham (UK), Silvia Espín (ES), Pablo Sánchez Virosta (ES), Simon Birrer (CH), Dani Studler (CH)



# Tawny Owl (*Strix aluco*)

- generalist raptor
- distributed across Europe
- extensively studied



Distribution map according to IUCN version 2020.1 (Alexander Kürthy)

→ suitable as the Proof of Concept Species

# Aim of our research



- **overview** of selected contextual parameters → a baseline for interpretation of ecotoxicological results
- **assess geographical variation** in each variable across Europe
- draft **best practice guidance** for monitoring of selected contextual data



# Population contextual data and contaminants

Contextual data are needed to **evaluate and interpret contaminant analysis results** which can lead to further mitigation.

## EXPOSURE

- diet
- dispersal & movements
- habitat
- population size
- breeding phenology

## IMPACT

- population trend
- clutch size
- survival
- nest failure
- egg shell thickness



photo: A. Vrezec



photo: A. Vrezec

# Contaminant exposure

in space

density & population size  
home range size  
natal & breeding dispersal

in time

breeding phenology  
prey availability

diet  
habitat selection



# Contaminant exposure

in space

in time

density & population size  
home range size  
natal & breeding dispersal

breeding phenology  
prey availability

diet  
habitat selection

morph variability  
genetic variation



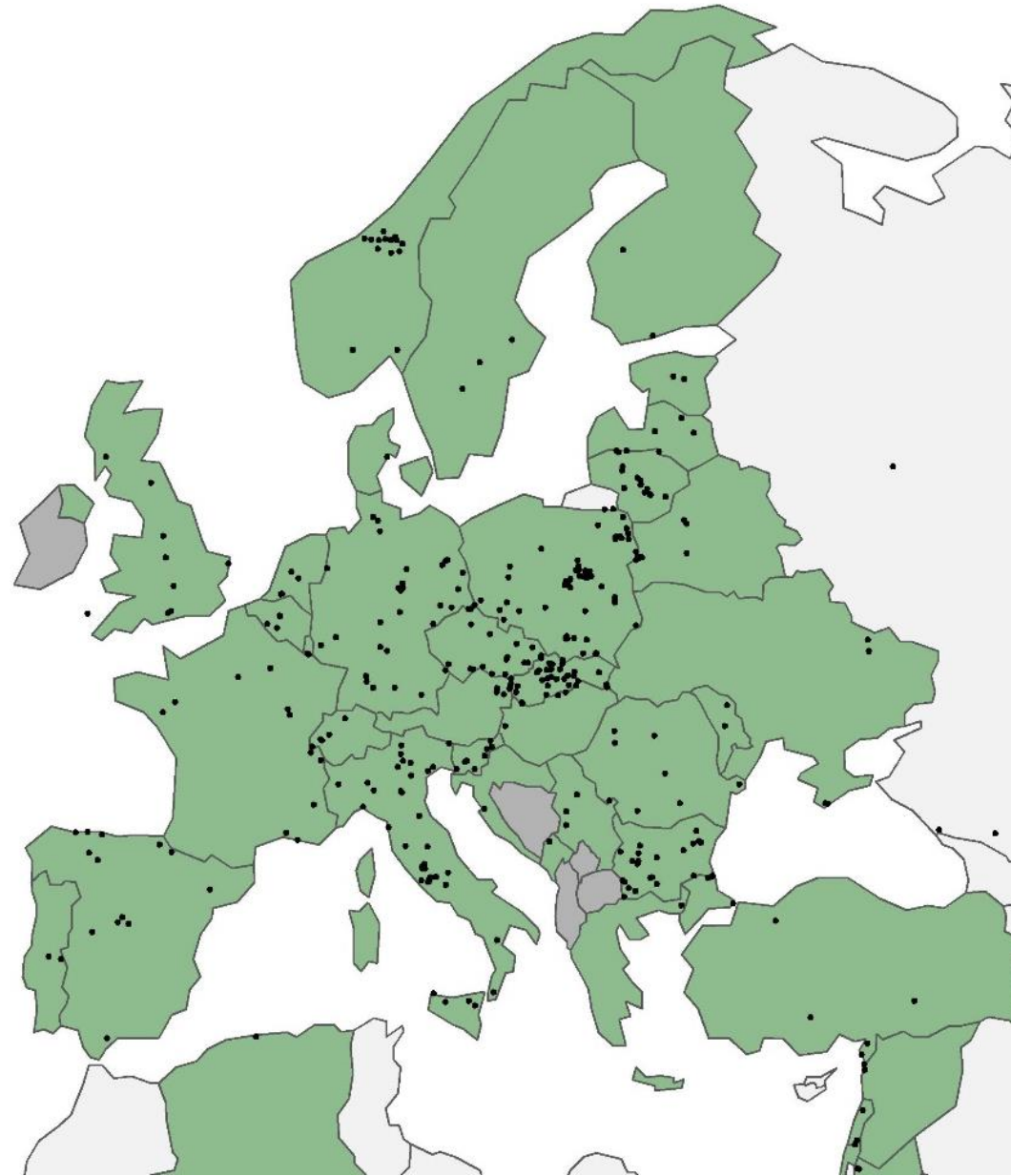
photo: A. Vrezec

# Diet – preliminary results

**204 studies** (published and “grey” literature)

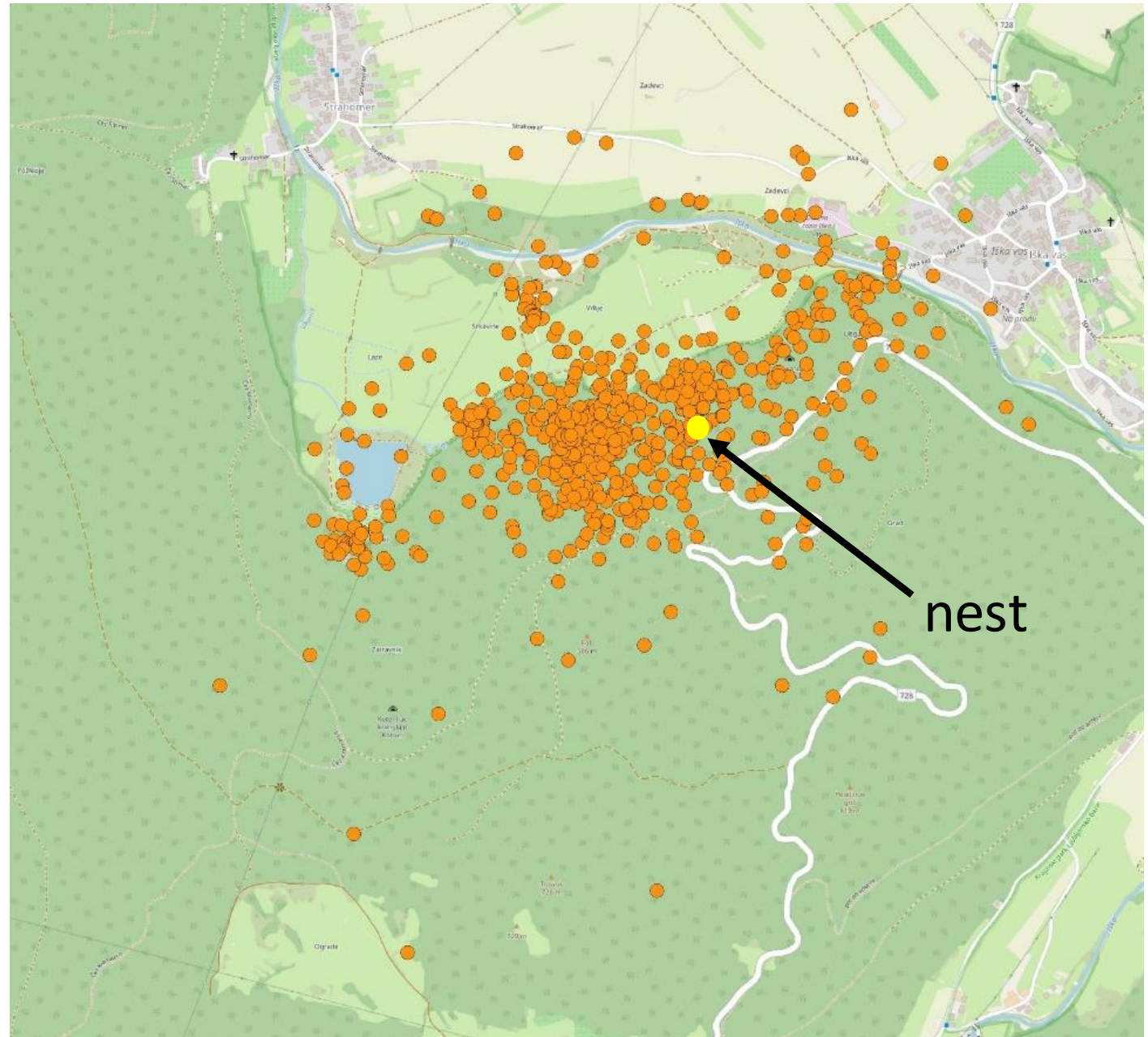
**> 400 locations**

- data for invertebrates (N): ~ 50 %
- data for biomass: ~ 40%



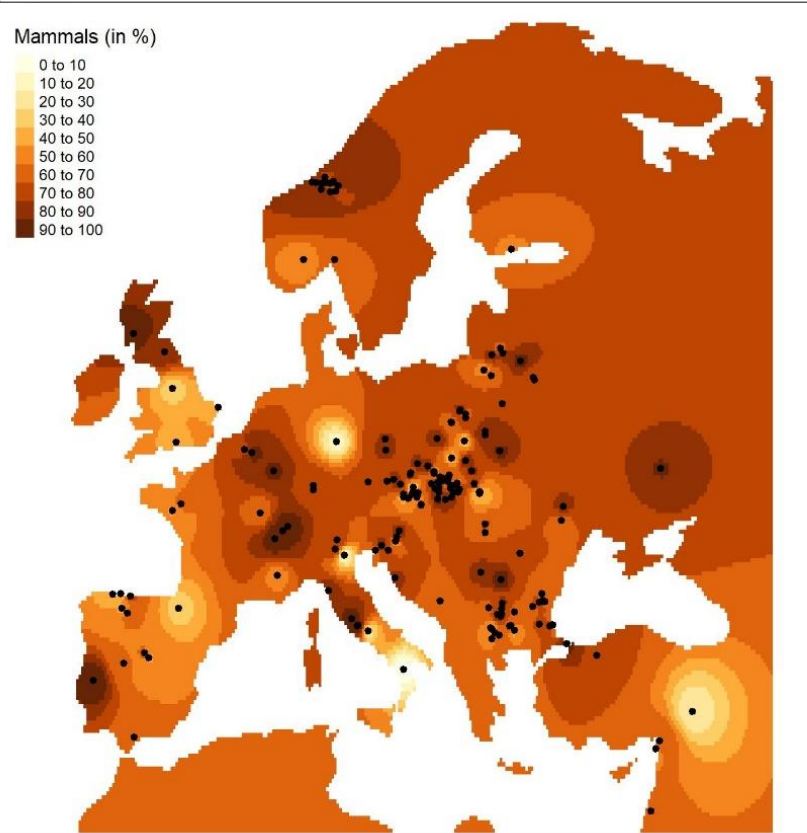


# Diet and habitat

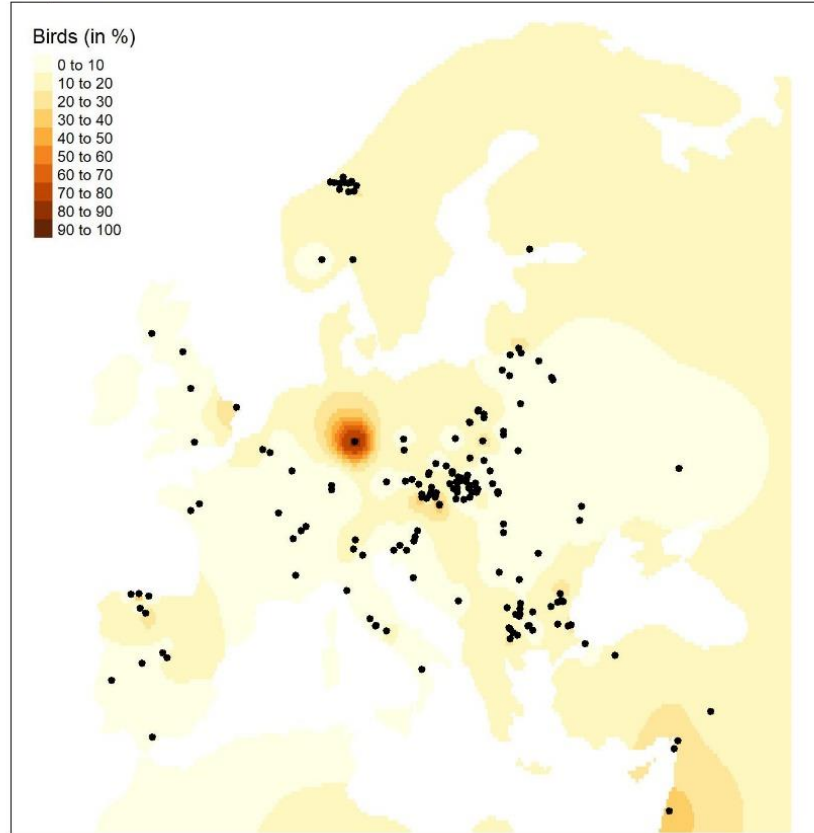




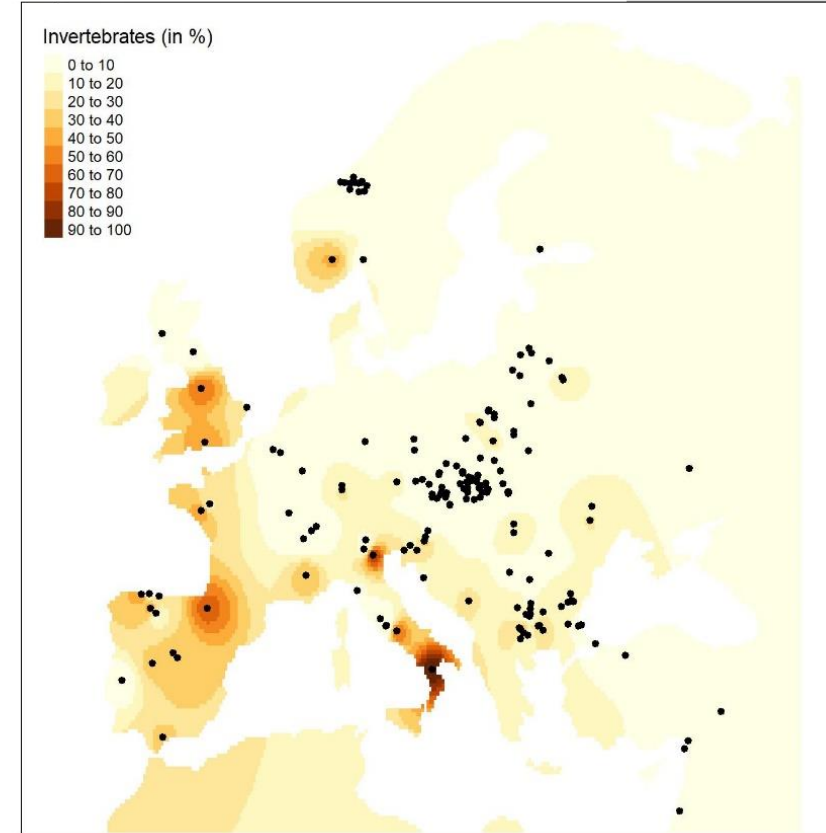
# Main groups - frequency [%]



mammals

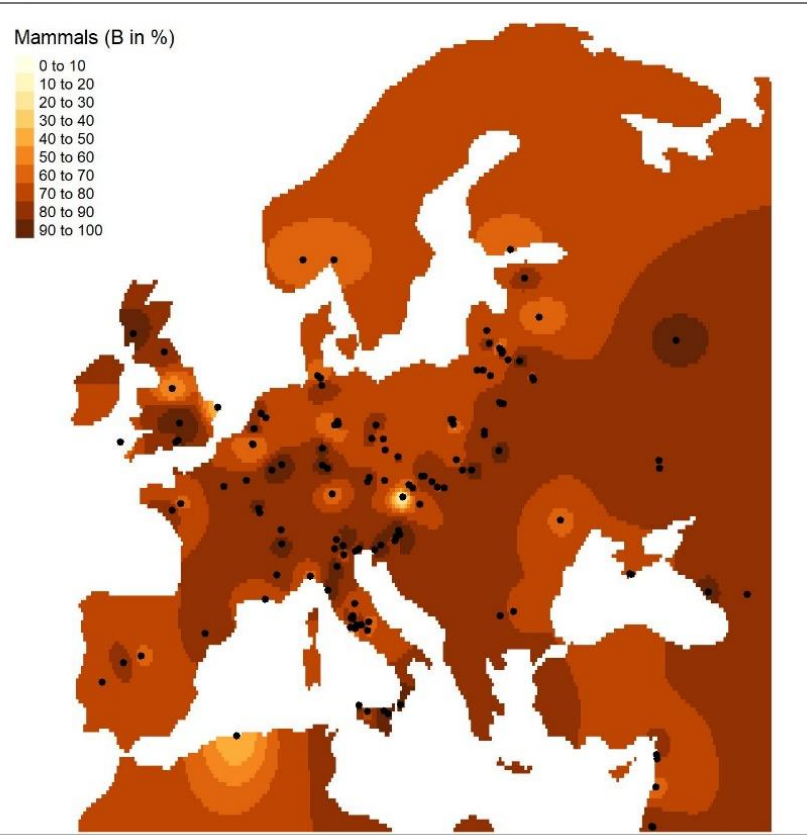


birds

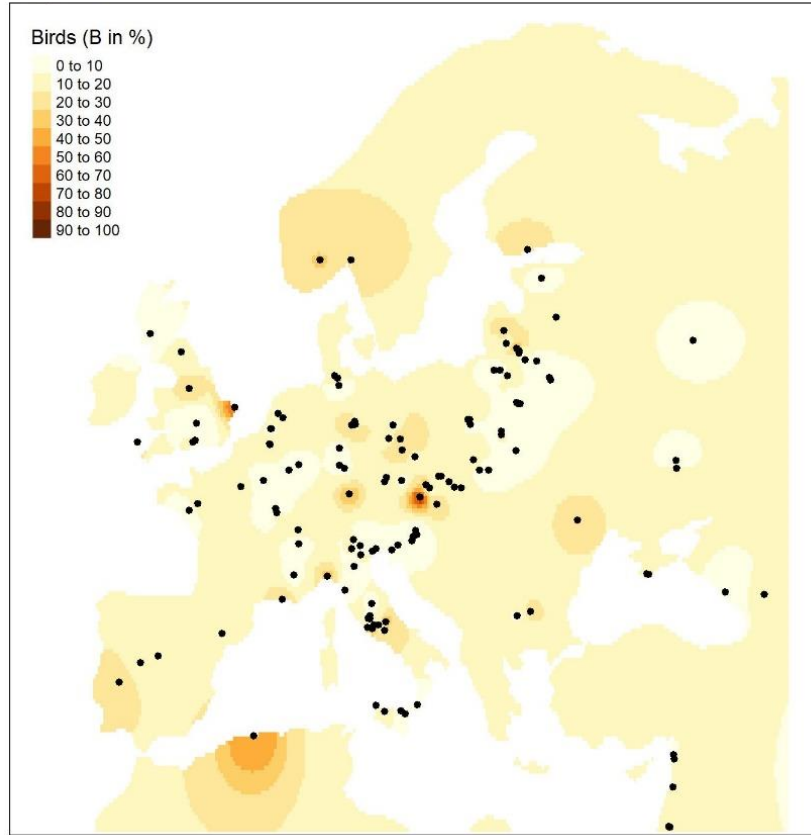


invertebrates

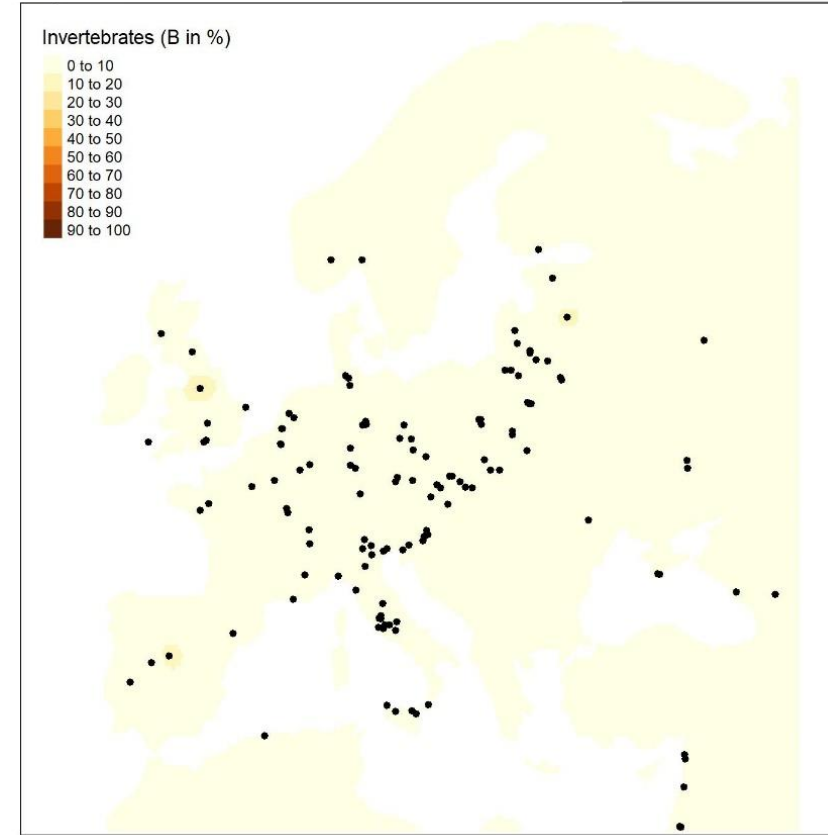
# Main groups - biomass [%]



mammals

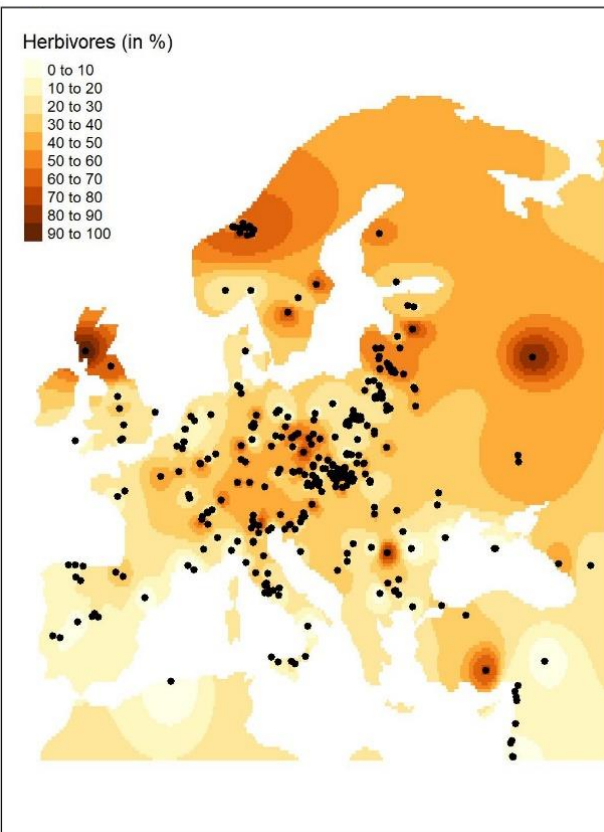


birds

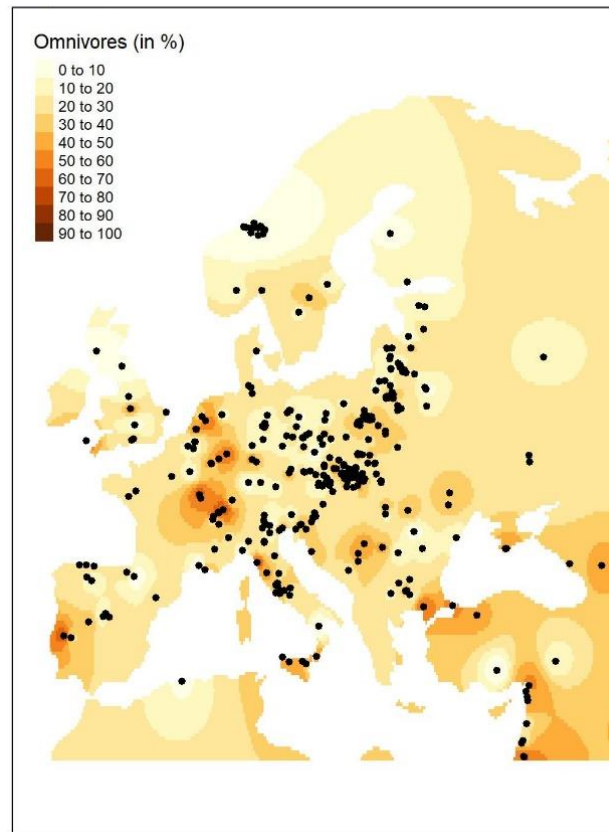


invertebrates

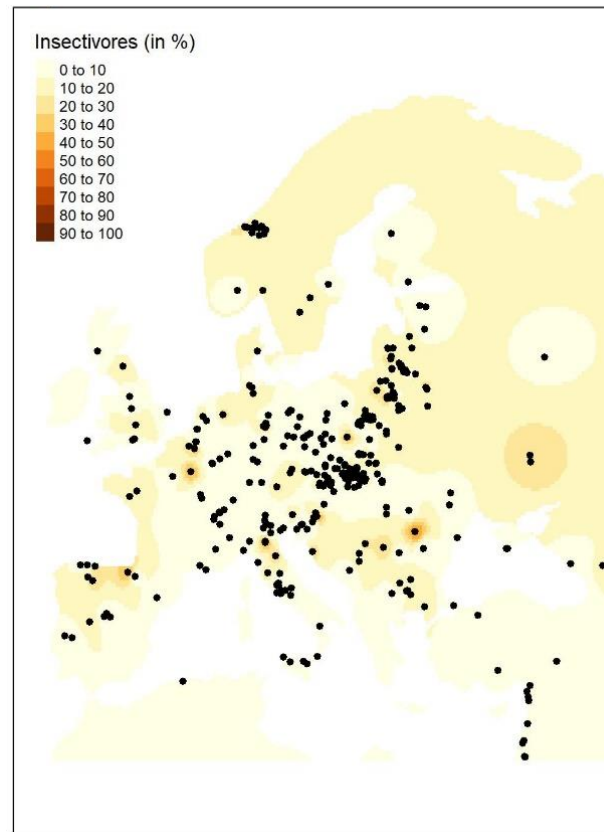
# Mammals by diet – frequency [%]



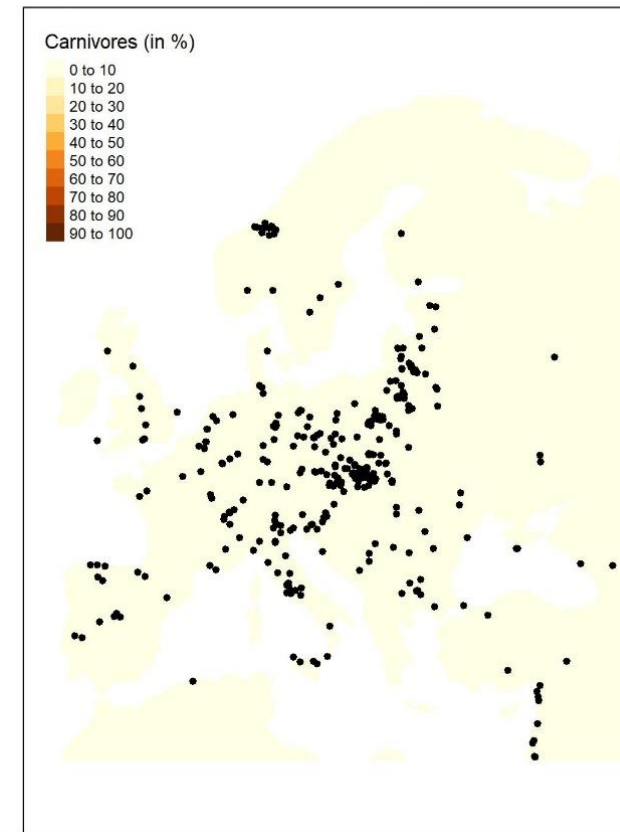
herbivores



omnivores



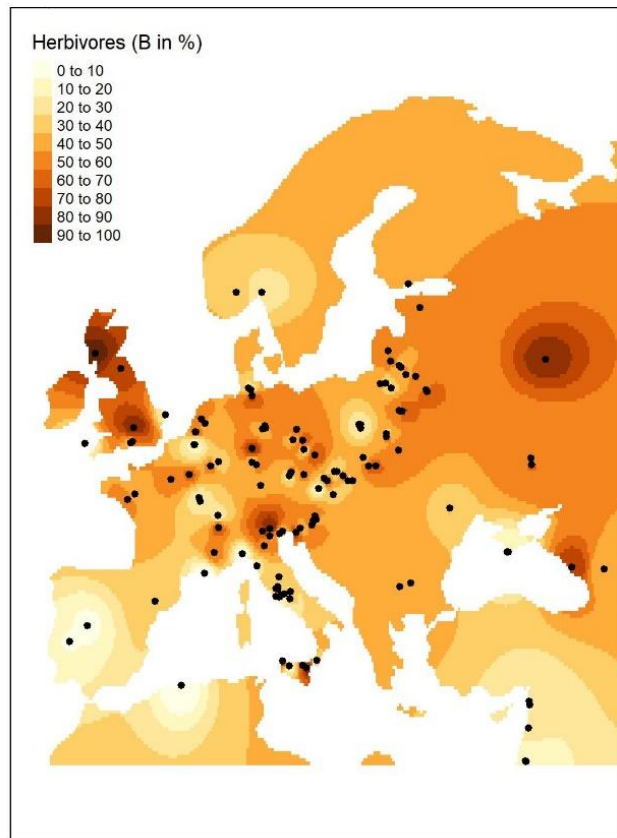
insectivores



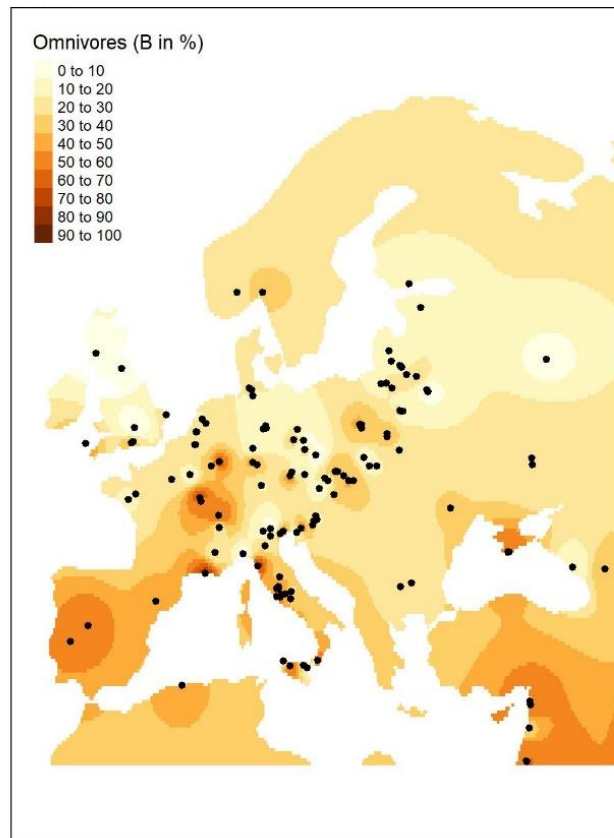
carnivores



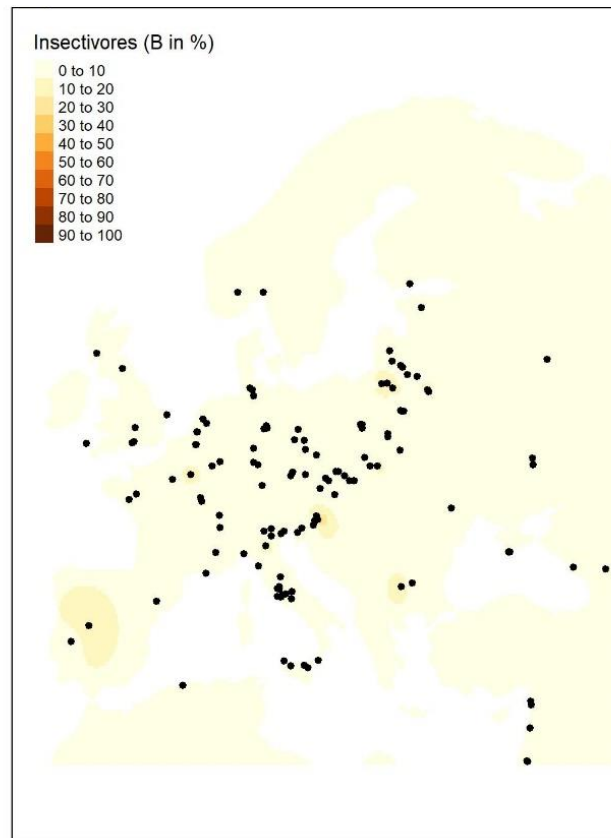
# Mammals by diet – biomass [%]



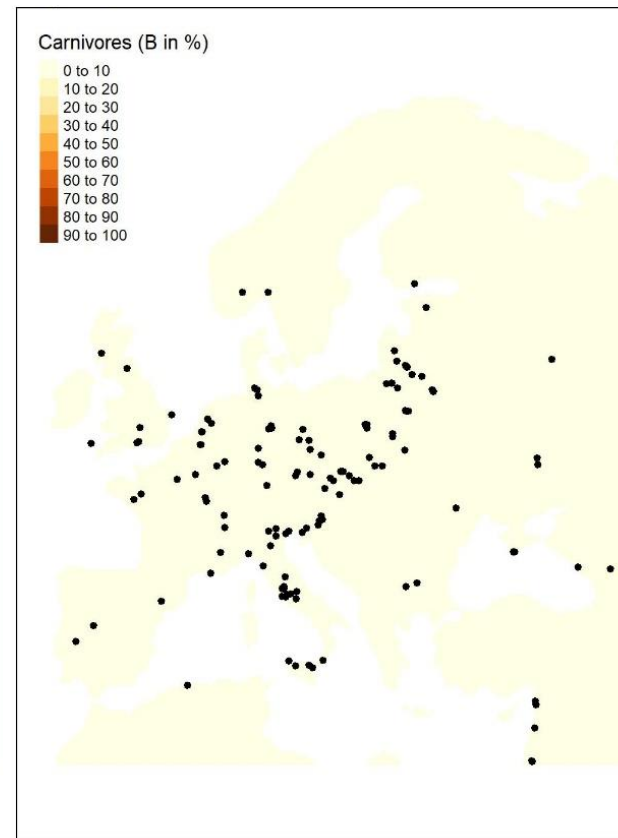
herbivores



omnivores

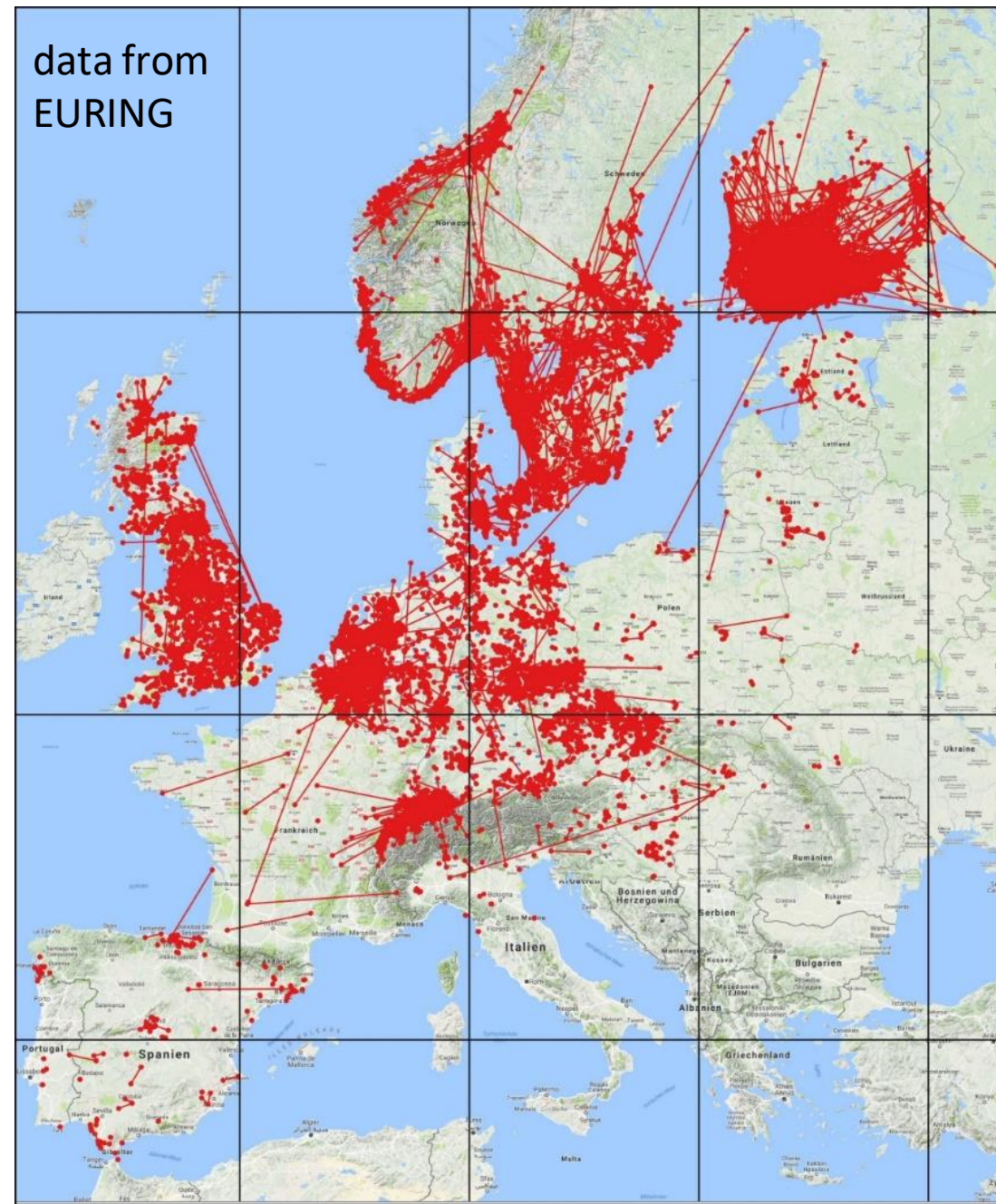
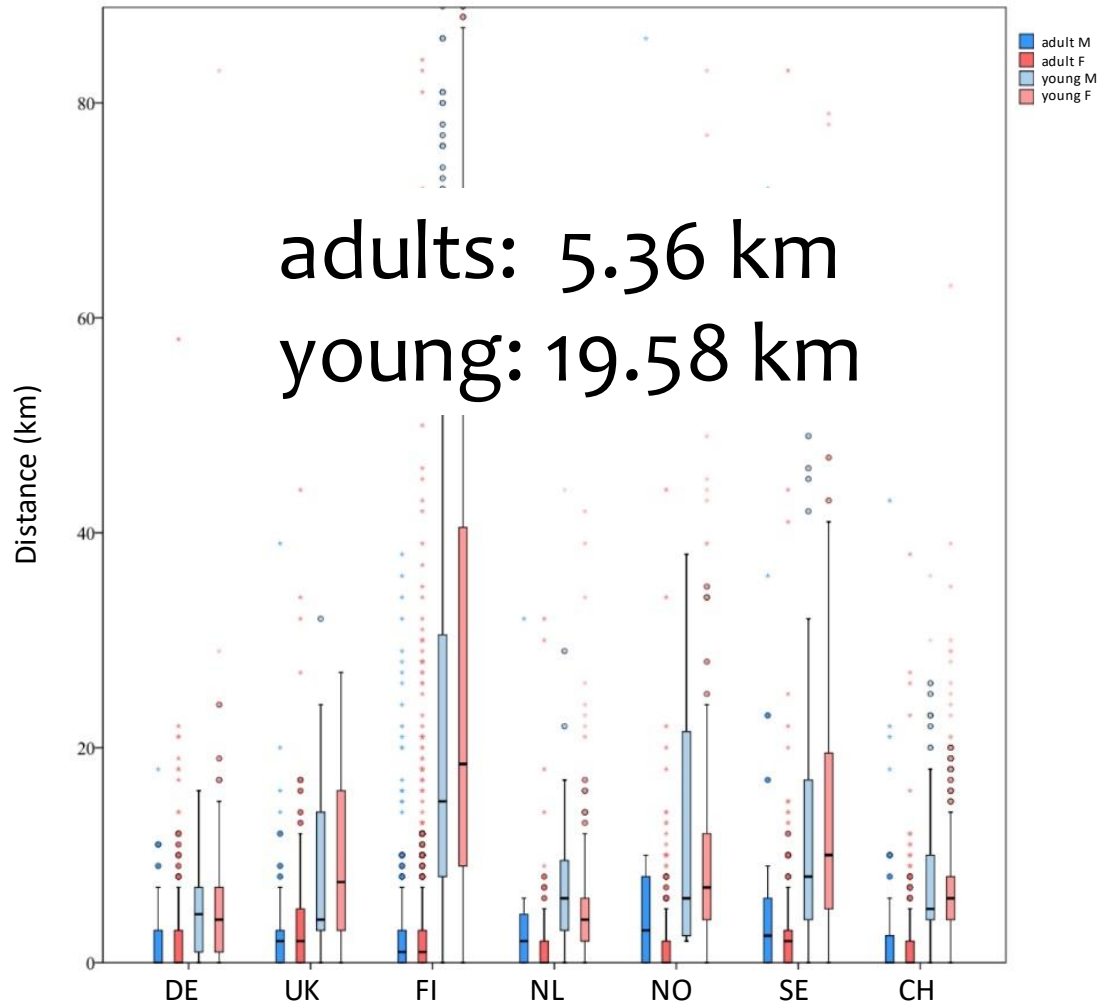


insectivores



carnivores

# Dispersal distances





# Contaminant impact

- Population & distribution trend
- Nesting frequency
- Nest abandonment
- Productivity
- Survival of young & adults
- Age & sex structure





# Contaminant impact

- **Population & distribution trend**
- Nesting frequency
- Nest abandonment
- **Productivity**
- Survival of young & adults
- Age & sex structure

## **Additional mortality causes:**

- + Weather/climate change
- + Causes of death (diseases, persecution etc.)



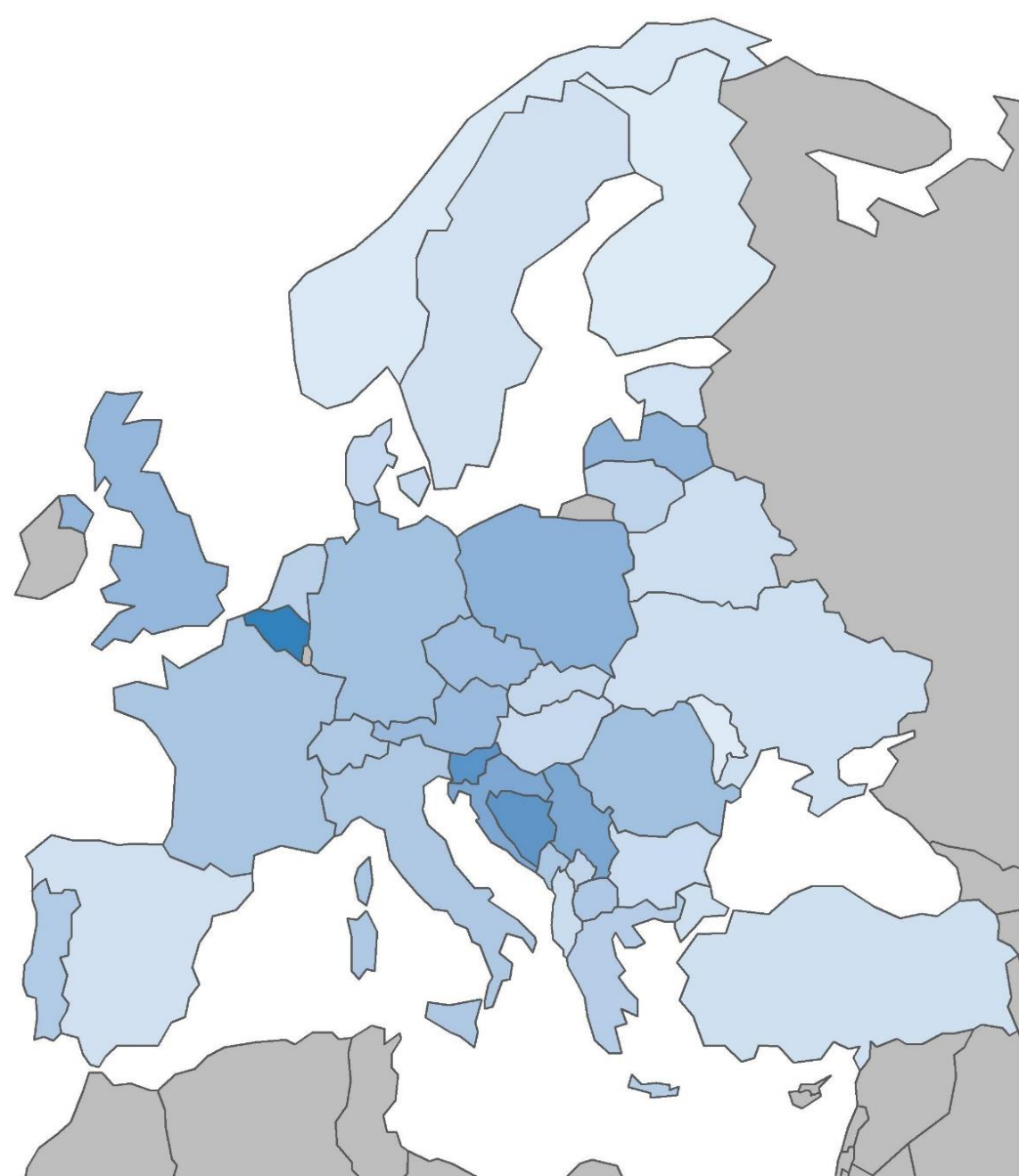
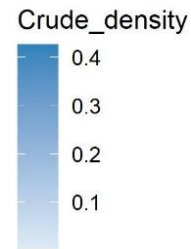
photo: A. Vrezec

# Crude density

[breeding pairs / km<sup>2</sup>]

population stronghold in  
the Balkan peninsula

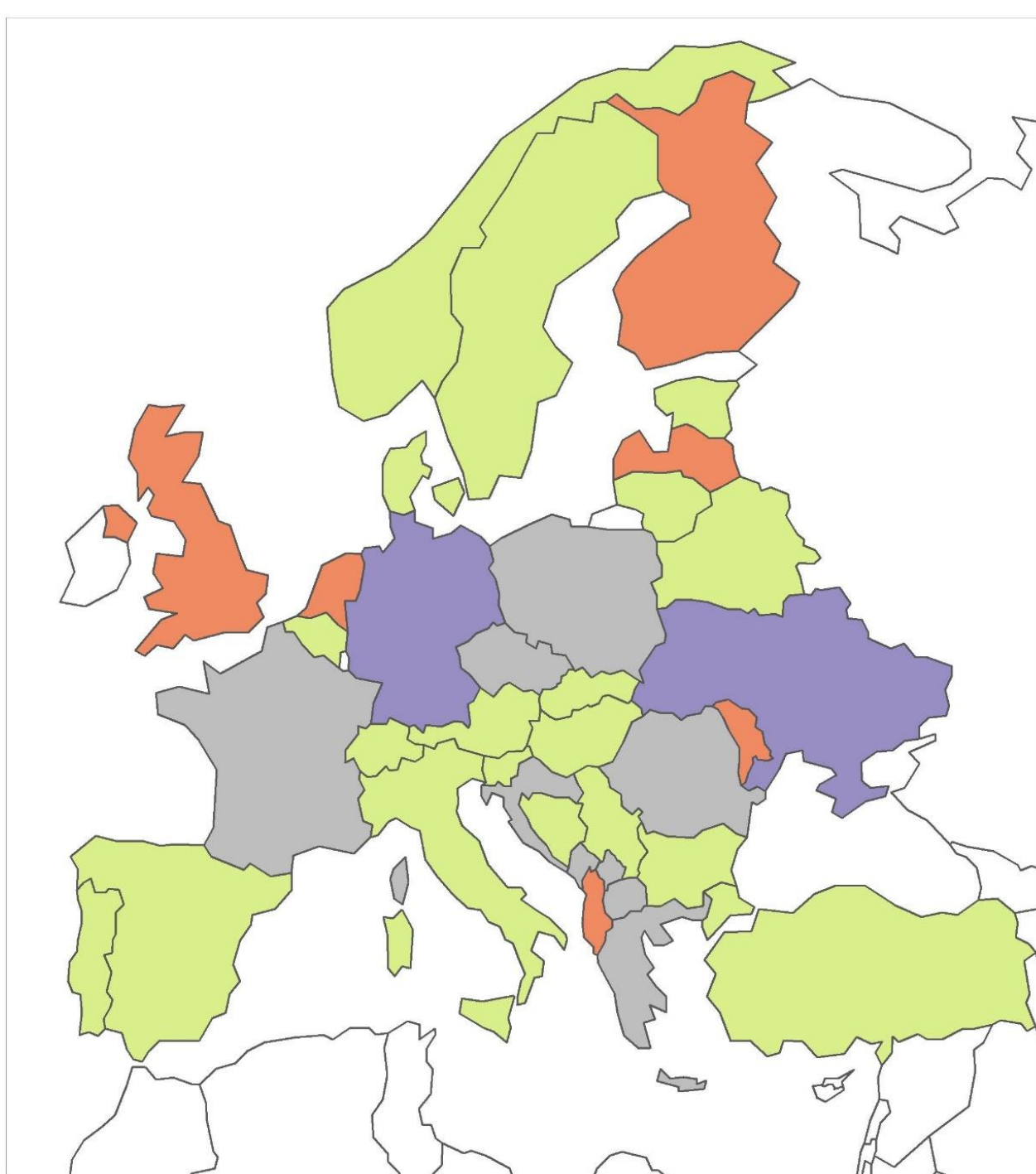
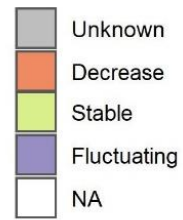
high densities also in  
Belgium, the UK, Poland  
and Latvia



Adapted after data from BirdLife (2017)

# Population trend

Population\_trend

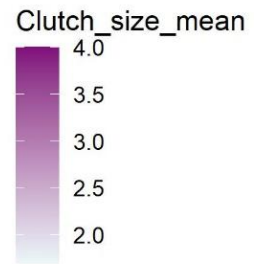


Adapted after data from BirdLife (2017)

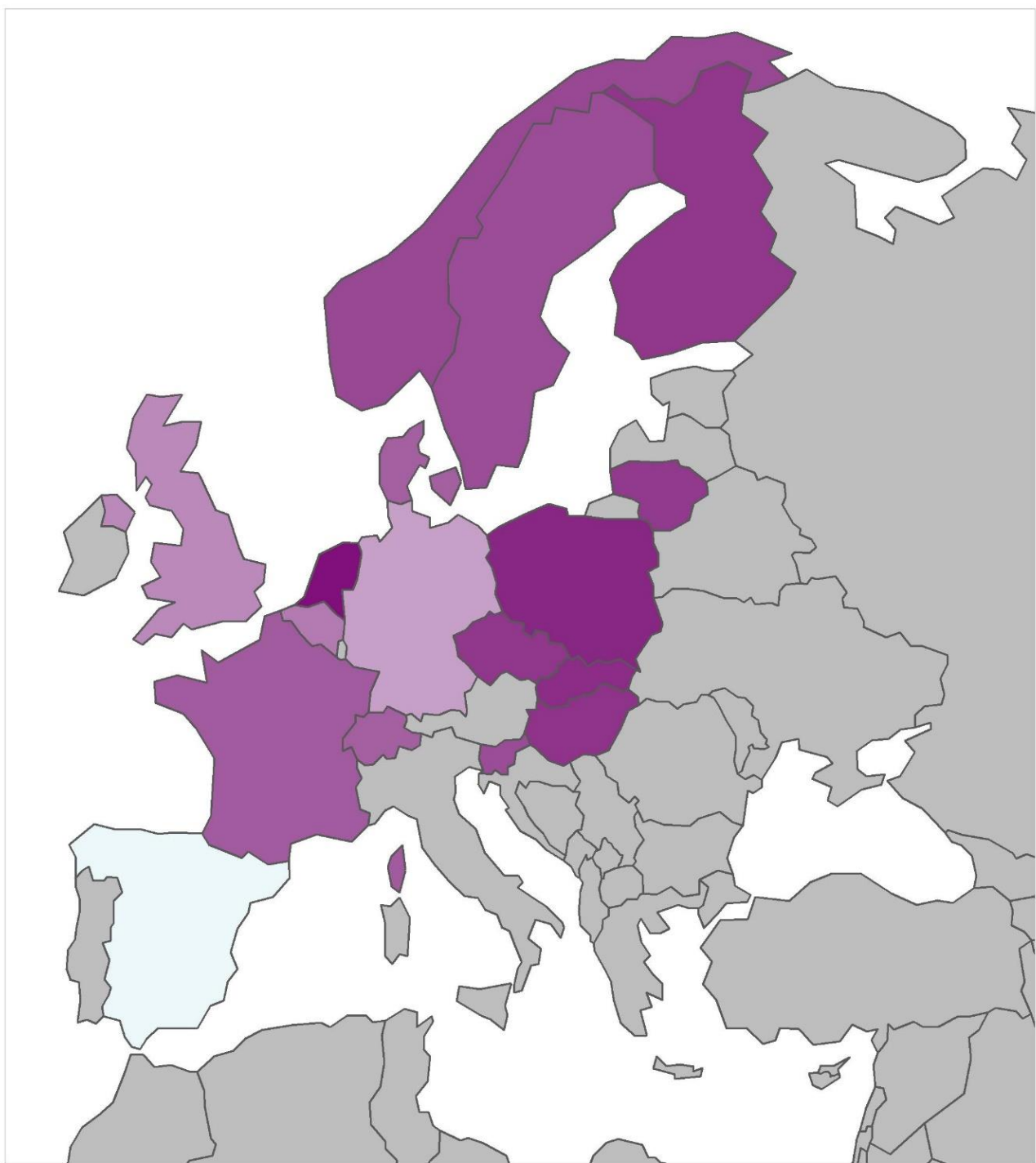


# Productivity

clutch size



preliminary results



# Value of field data

- identified missing gaps in crucial contextual parameters should be fulfilled at panEuropean scale
- problem of not publishing (raw) basic information (highly needed!)
- lack of contextual data can lead to wrong conclusions on contamination results
- altered environmental conditions may alter contamination level, therefore regular monitoring of key contextual data at panEuropean scale is necessary



## **Long-term goal:**

building a strong network of researchers that can contribute field data →  
proper conservation of the species is possible only in collaboration



**Thank you for  
your attention.**

