

# Proof of concept: Raptor Biomonitoring



- Sample size –Distribution
- Species
- Sample type
- Chemicals
- Field/Collections
- Labs and methods

# Sample size - Distribution

1 bird per 10,000 km<sup>2</sup>

1080 birds for Europe / **439** birds for EU

Spain 51,

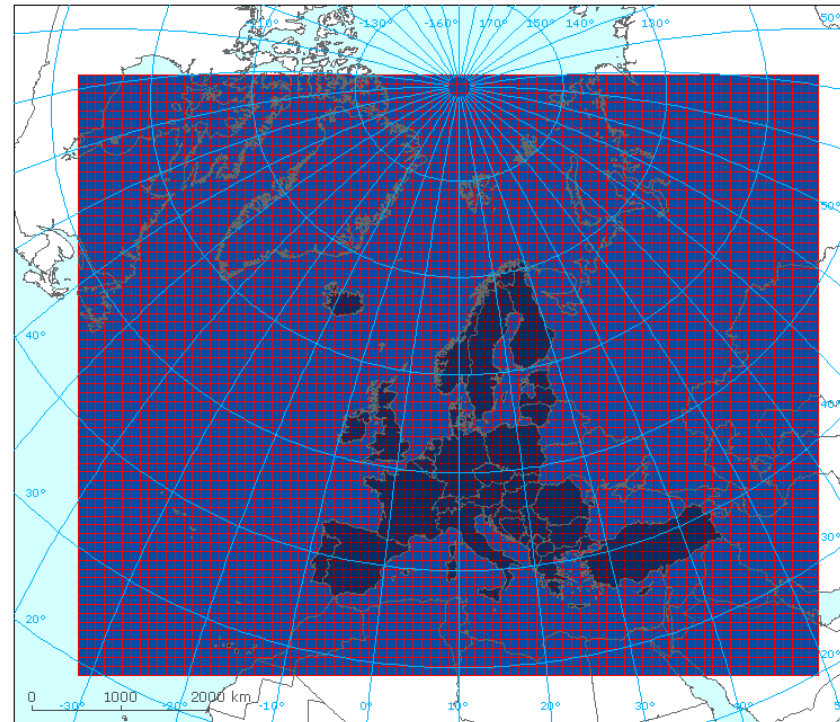
France 64

UK 24

Germany 36

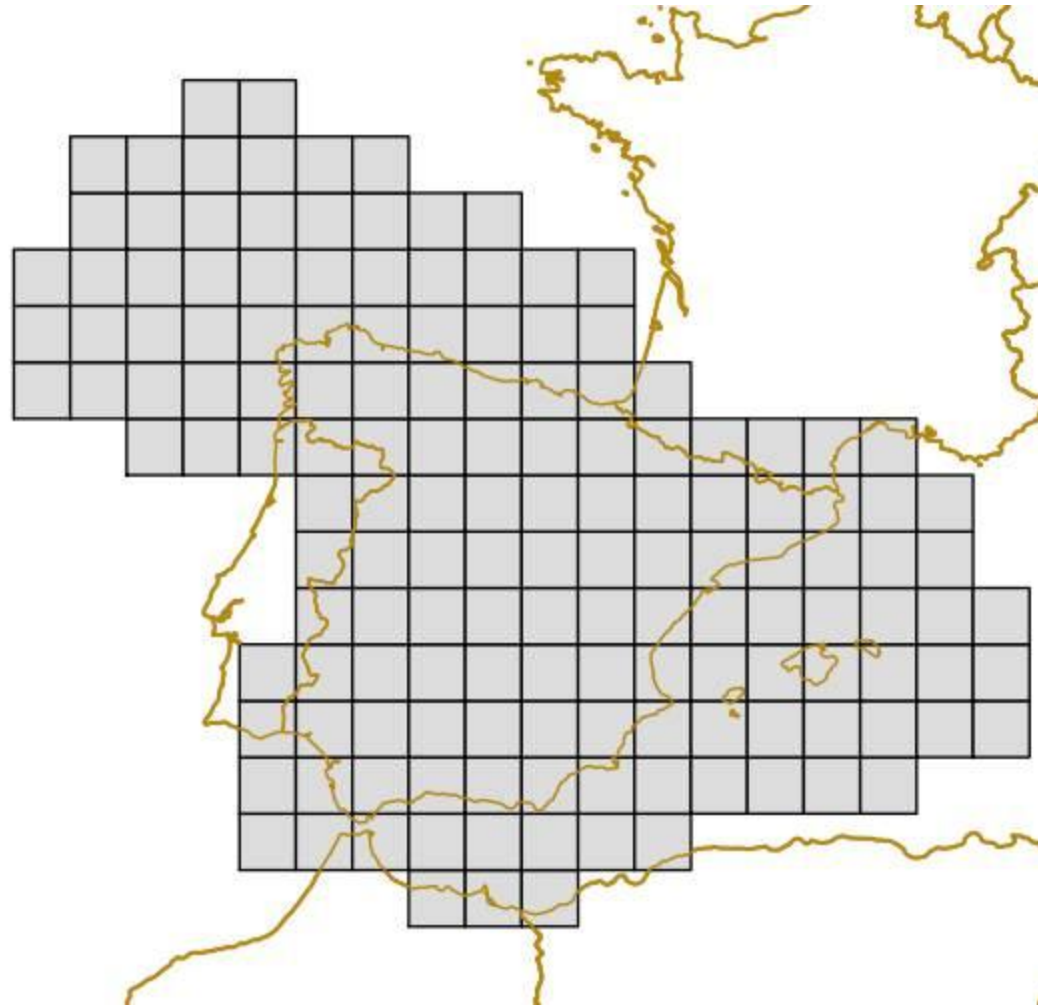
Sweden 45

...



<https://www.eea.europa.eu/data-and-maps/data/eea-reference-grids-2>

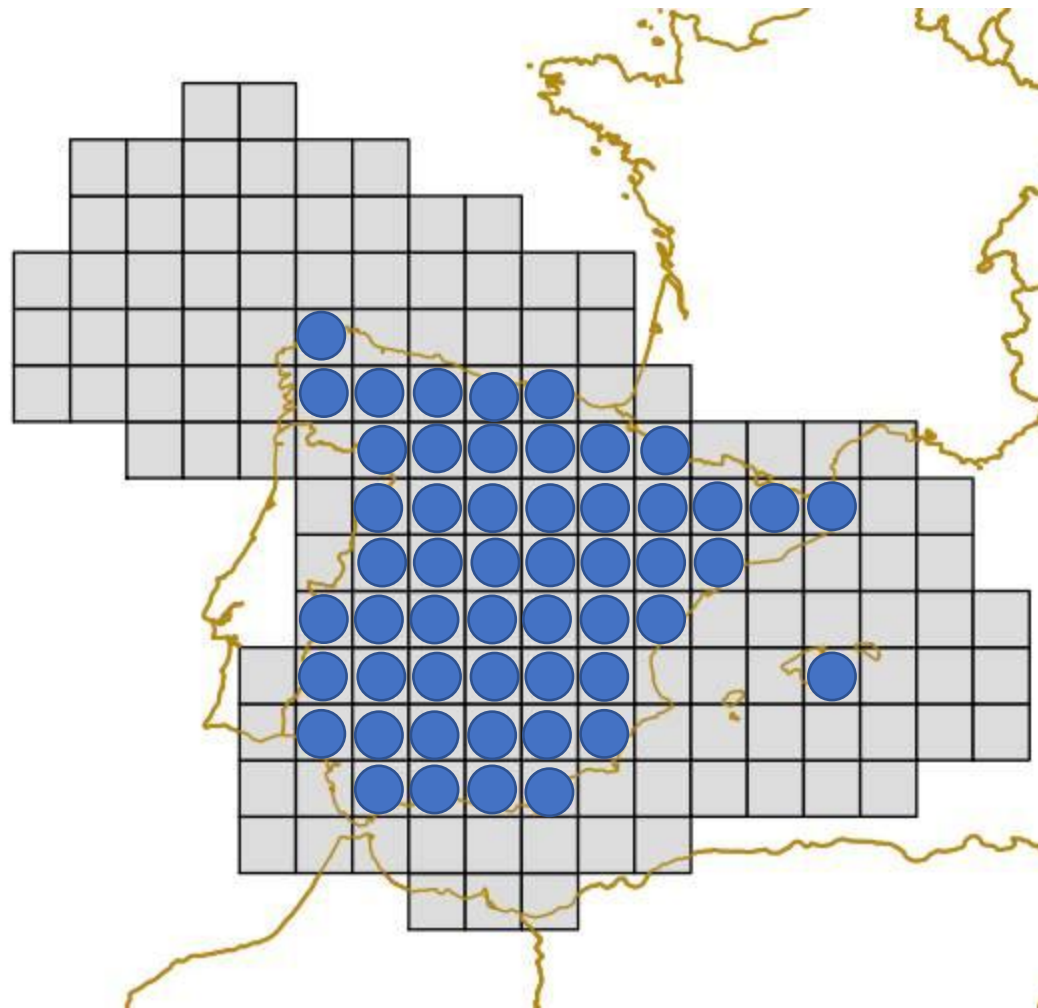
# Spain



100 × 100 km

<https://www.eea.europa.eu/data-and-maps/data/eea-reference-grids-2>

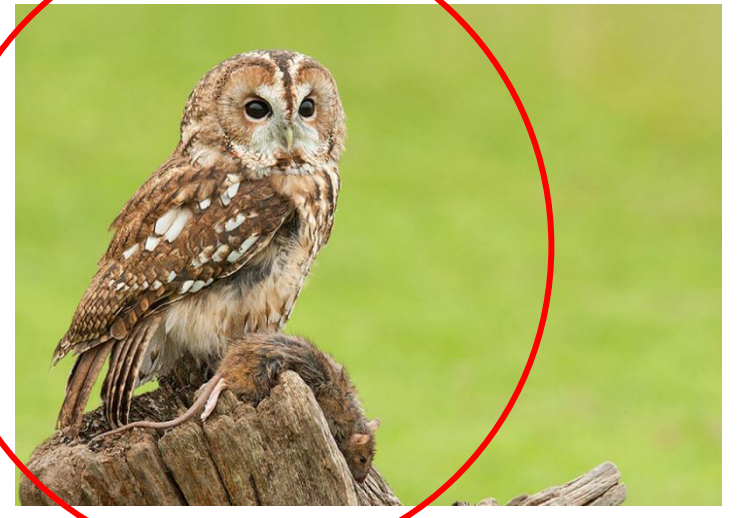
# Spain



**N=52**

# Species

- Only one species
- Widely distributed or with close relatives
- Easy to sample
- Samples in banks/collections



# Sample type

## Active

- Blood
- Eggs

OR

## Passive

- Liver

Road-kills

WRC

Banks



# Chemicals

- Metals: Hg / Pb
  - POPs: DDE, PCB153, PFAS...
  - Pesticide: Rodenticides
- Blood/egg/liver
  - Blood/egg/liver
  - Liver



# Field / Collections

- New samples
- Stored samples
- Bank or collections
- Cost of sampling and shipping





# Labs and Methods

- Different Labs / Only one per chemical
- Interlaboratory study
- Reference sample
- Cost of analyses
- STSMs



# Criteria for sample selection

- Fresh or frozen carcasses
- Frozen liver samples ( >5 g)
- Known location
- Period 2014-19
- Of these three species: FALTIN/ BUTBUT/STRALU

**Agreement form?**



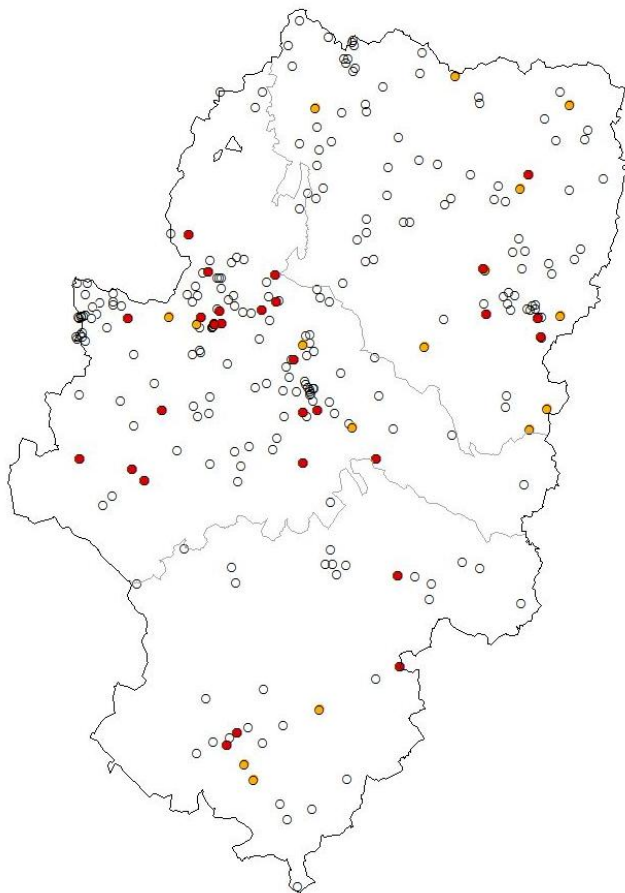
## **Sample information (their own database or fill this in a Excel file:**

- Species (FALTIN/BUTBUT/SRTALU):
- Sample (carcass/liver):
- Sex (M/F):
- Age (1y/Ad):
- Location (Municipality/Country):
- Coordinates:
- Date of death: (MM/YYYY)
- Cause of death:
- Ring number (if ringed):



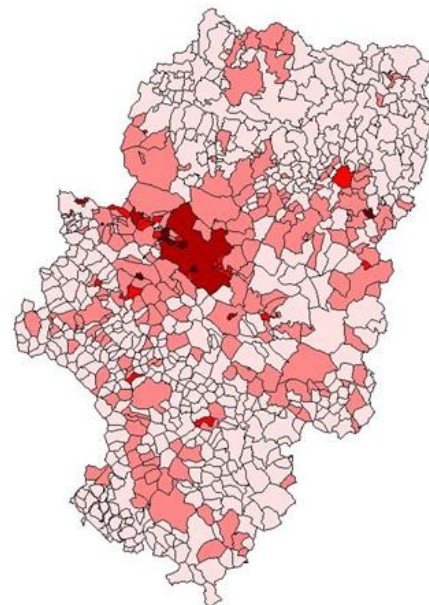
# Retrospective compilation of published data (STSM?)

## Rodenticides in wildlife from Aragón (NE Spain)

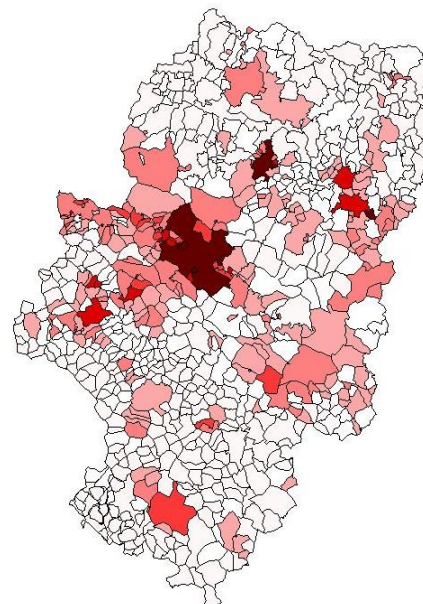
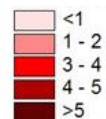


Rodenticides in liver (ng/g)

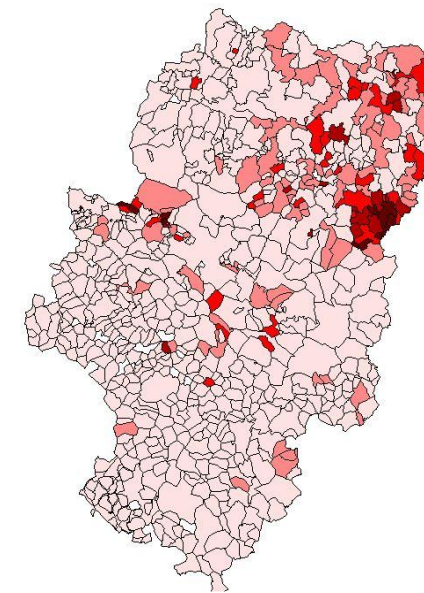
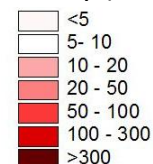
- ND
- 0.1-200
- >200



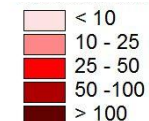
Urban Surface (%)



Human density (habitants/km<sup>2</sup>)



Cattle density (individuals/km<sup>2</sup>)



López-Perea, J.J., Camarero, P.R., Sánchez-Barbudo, I.S., Mateo, R. 2019. Urbanization and cattle density are determinants in the exposure to anticoagulant rodenticides of non-target wildlife. *Environmental Pollution* 244: 801-808.