



Leibniz Institute for Zoo  
and Wildlife Research  
IN THE FORSCHUNGSVERBUND BERLIN E.V.



# Rodenticides in urban birds of prey

Alexander Badry  
(IZW/UBA)

Lab: Dr Oliver Krone

Leibniz Institute for Zoo und Wildlife Research (IZW)

**In collaboration with:**

Dr Detlef Schenke

Julius Kühn-Institut (JKI)

Federal Research Centre for Cultivated Plants



Gabriele Treu

Federal Environment Agency (UBA, IV2.3)

Umwelt  
Bundesamt

# Carcass monitoring at the IZW Berlin

- Started in the 1990ties
- Dissection of carcasses which were found dead within Germany



- Determination on causes of death
- Storage of various organs for future analysis

## Goshawk (*Accipiter gentilis*)

1996-2019

- Goshawks are usually living in forests!
- Established stable population in cities throughout Germany in the recent years
- Prey consists dominantly of other birds with a lesser degree of mammals
- We focussed on goshawks from Berlin!



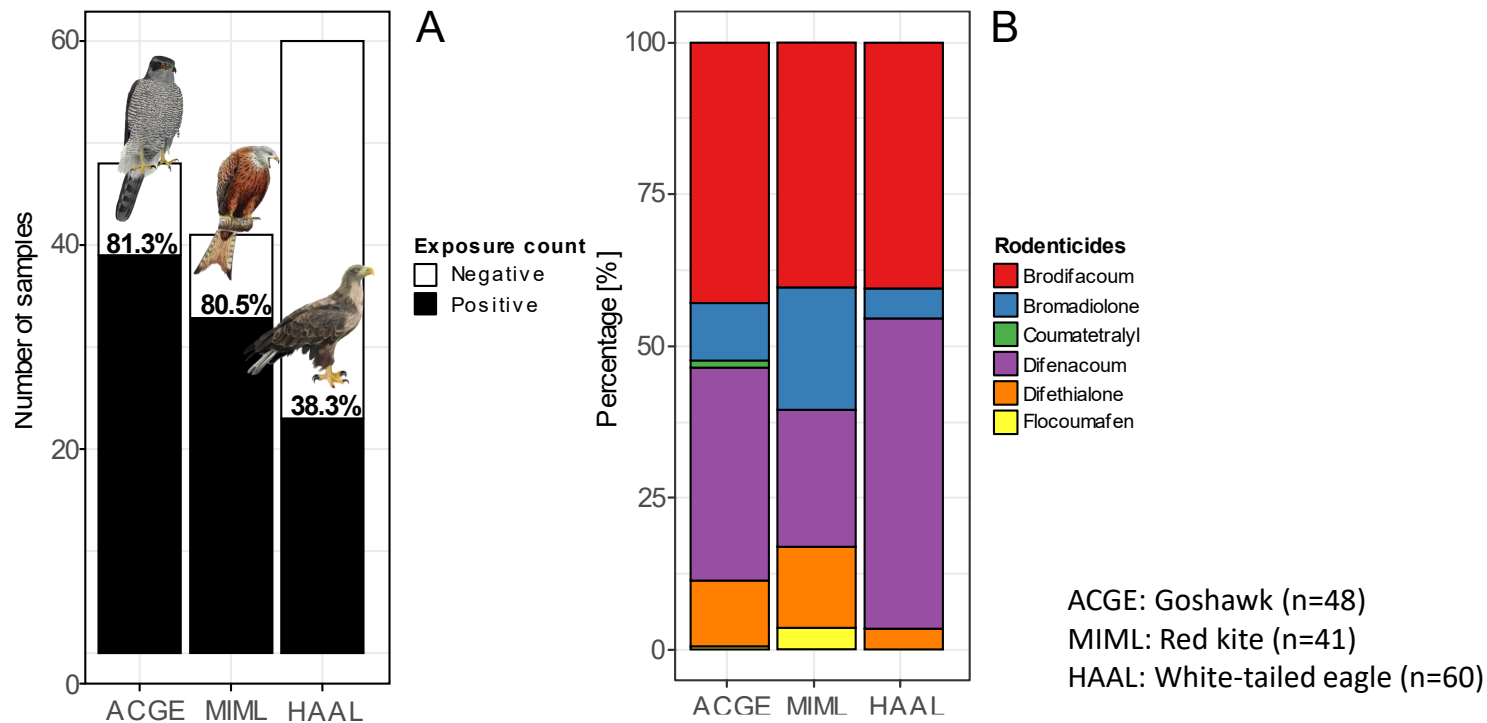
# Anticoagulant rodenticides

## Application (1996-2019)

- Commonly applied to control populations of rats, mice and, in some countries, voles
- Use as plant protection product (expired), in livestock farming, in urban areas & canalizations

## Mode of action

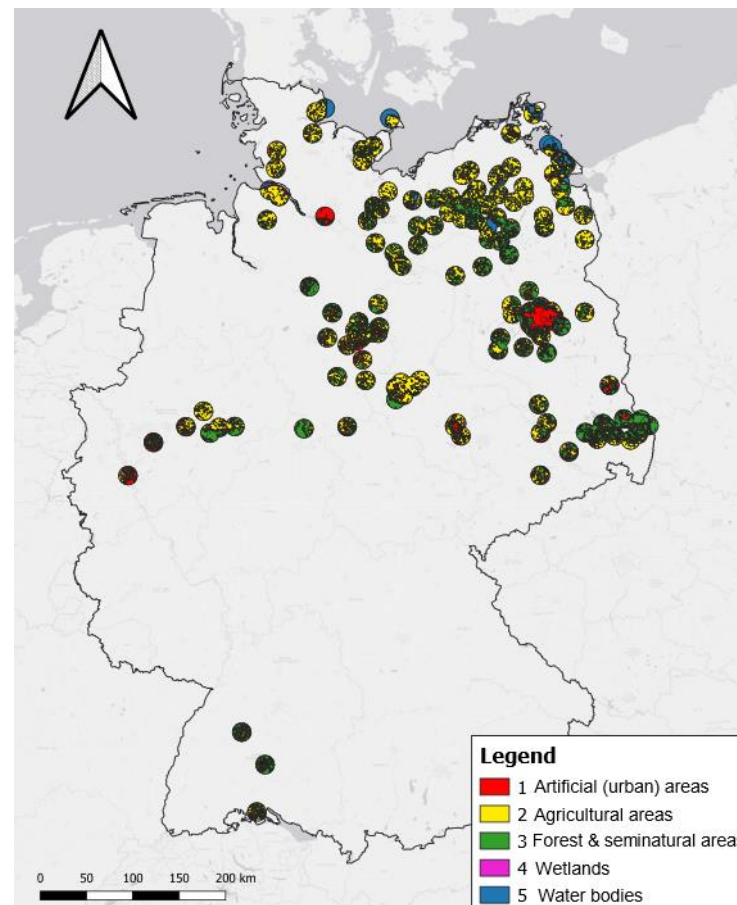
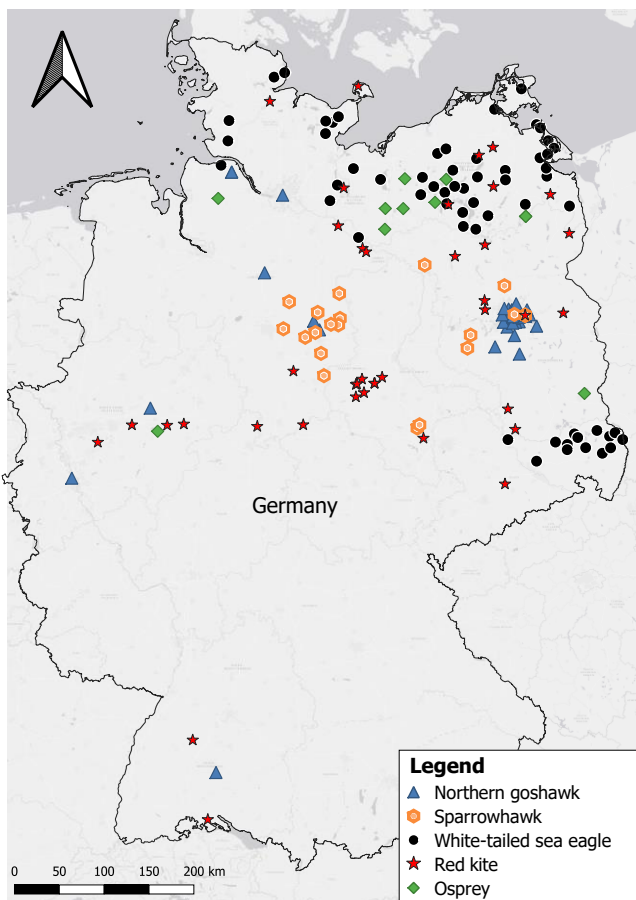
- Exposure leads to a failure to synthesize clotting factors like prothrombin  
→ Delayed death of exposed rodents



# Sample origin and land cover data

Quantification of land cover data around a 10 km radius where a bird was found

- Corine land cover data



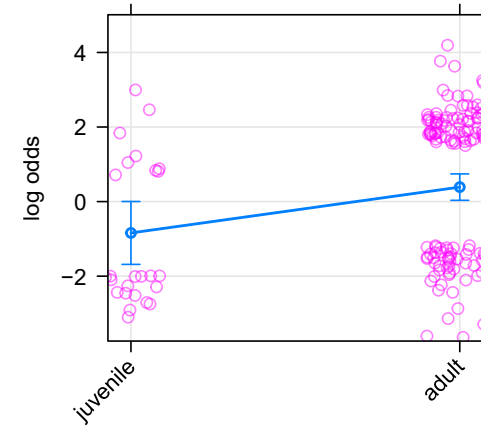
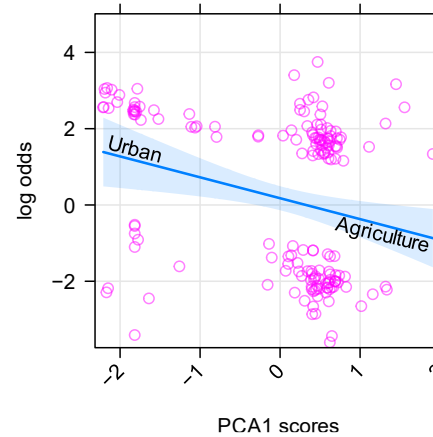
# Which factors influence rodenticide exposure?

**Generalised linear modelling** (binomial, logit link, n=176)

## Rodenticide exposure:

### Land cover:

- Land cover quantification around a 10 km radius (satellite images)
- Significantly increased with urban habitats (vs. agricultural habitats)

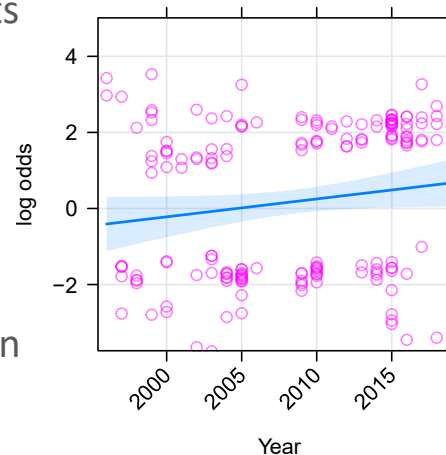


### Age class:

- Was significantly 3.4 times higher in adults (vs juveniles)

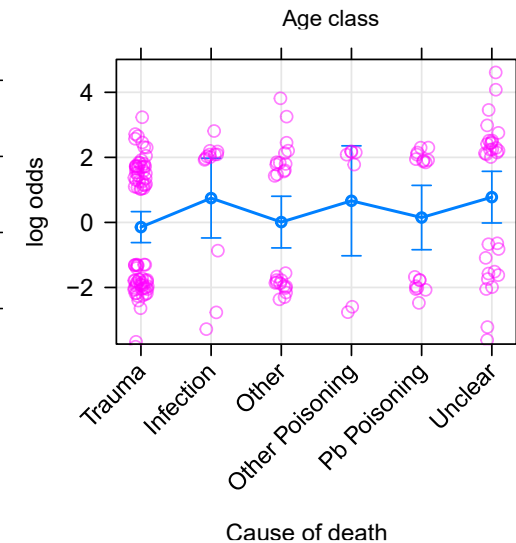
### Year of death:

- Tended to increase between 1996-2019 (p=0.07)

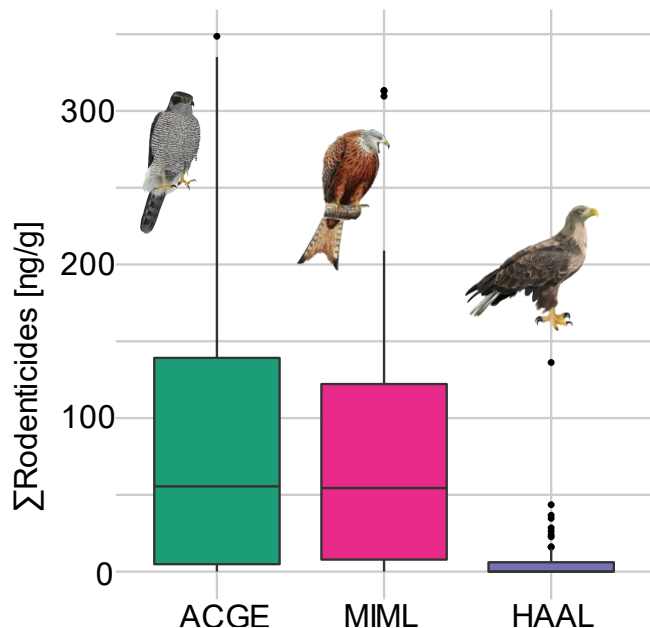


### Cause of death:

- Tended to be 2.5 times higher for unknown causes of death (p = 0.06) vs. birds died from trauma



# What about the extent of exposure?



## Critical rodenticide exposure (> 200 ng/g $\Sigma$ SGAR)

- 18.8% of urban goshawks
- 14.3% of red kites

## What do Goshawks eat in Berlin?

- Mainly pigeons and doves (65%)  
<https://doi.org/10.1098/rsos.201356>
- Songbirds are known to enter bait boxes  
<https://doi.org/10.1016/j.scitotenv.2020.144160>

## Taken together:

- Indication of a wide-spread contamination in urban food webs
- Urban Goshawks were despite their feeding habits in urban habitats equally exposed as a rodent predator
- Aquatic exposure of rodenticides cannot be excluded for white-tailed sea eagles – needs further investigation!

## Results published in Environmental Research:

- <https://doi.org/10.1016/j.envres.2020.110602>

E-Mail: [alexander.badry@uba.de](mailto:alexander.badry@uba.de)  
Telephone: +49 30 8903 5519



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Thank you for your attention!