

Prerequisites for a successful long-term earthworm monitoring in German agricultural landscapes within the MonViA Project

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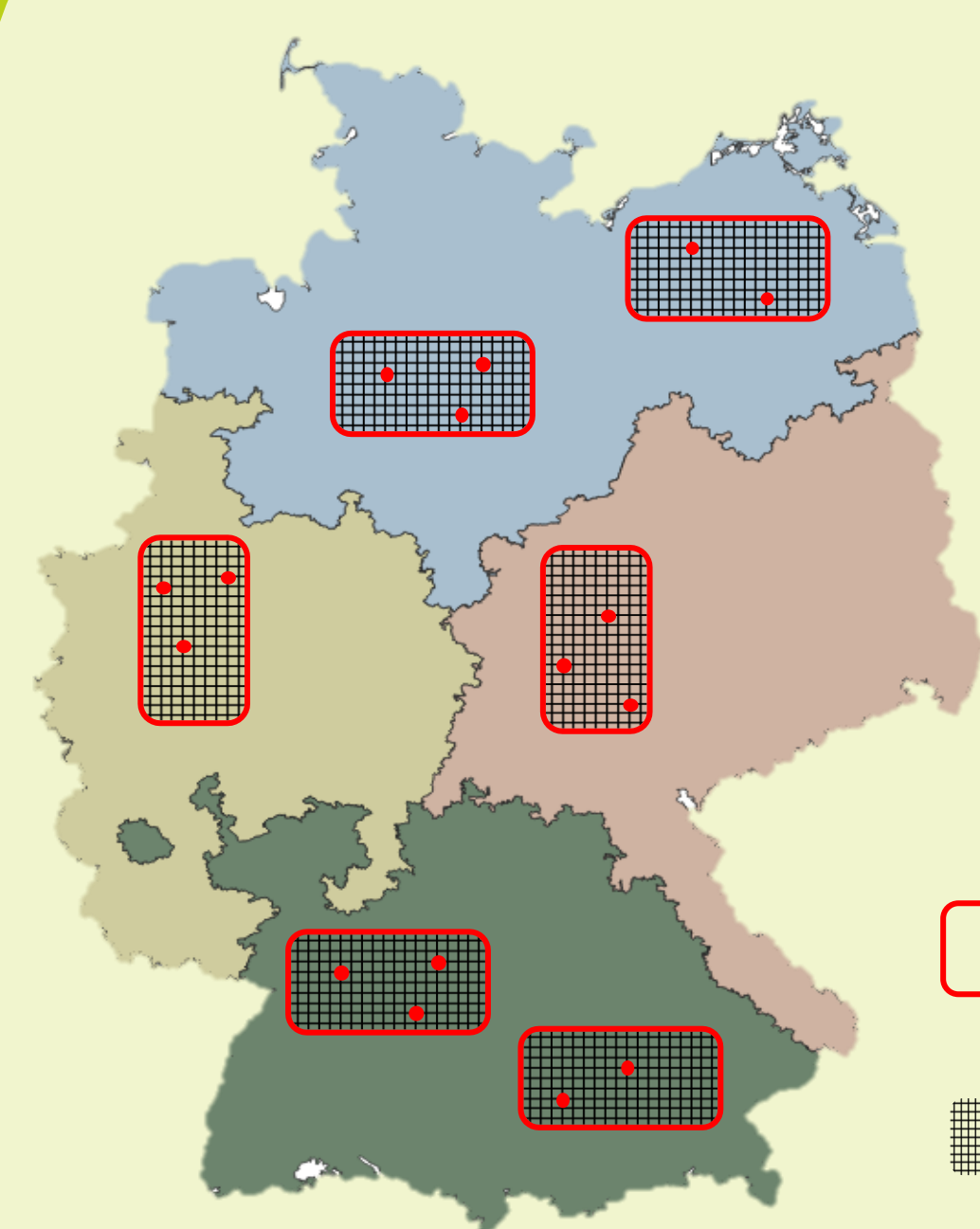
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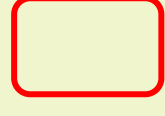
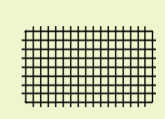

Objective

The National Monitoring of Biodiversity in Agricultural Landscapes “MonViA” is a joint project of the Julius Kühn Institute, the Thünen Institute and the Federal Office for Agriculture and Food with the aim of developing a modular monitoring system for agricultural landscapes. A crucial part of this monitoring is the earthworm community, which is essential for high and stable soil fertility. The aim is to develop a concept for a successful long-term monitoring of earthworms that allows the observation of community trend development especially regarding climate change and agricultural management systems.

Monitoring area



- Sites with comparable and for earthworms suitable natural conditions (“Comfort zone”)
- Distributed evenly throughout Germany
- Connected with existing monitoring projects to reduce costs whenever possible

-  “Comfort zone”
-  Existing survey grid of other monitoring projects
-  Monitoring site

Method selection

AITC-extraction with soil excavation + hand-sorting



Direct AITC-extraction without soil excavation



→ Direct extraction is cost-saving but recovers only ~ 30% of all individuals
~ 100% for *Lumbricus terrestris*

Successful long-term trend-monitoring of earthworms

Climate

- Precipitation
- Temperature
- Extreme weather events



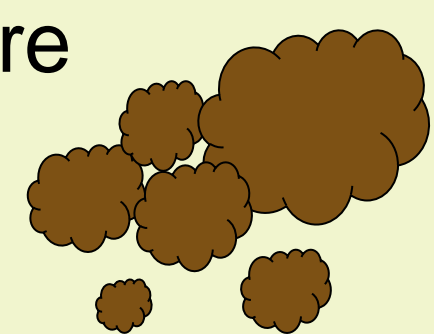
Policy

- Subsidies
- Promotional measures

Influencing factors

Soil

- pH-value
- Organic matter
- C/N
- Texture

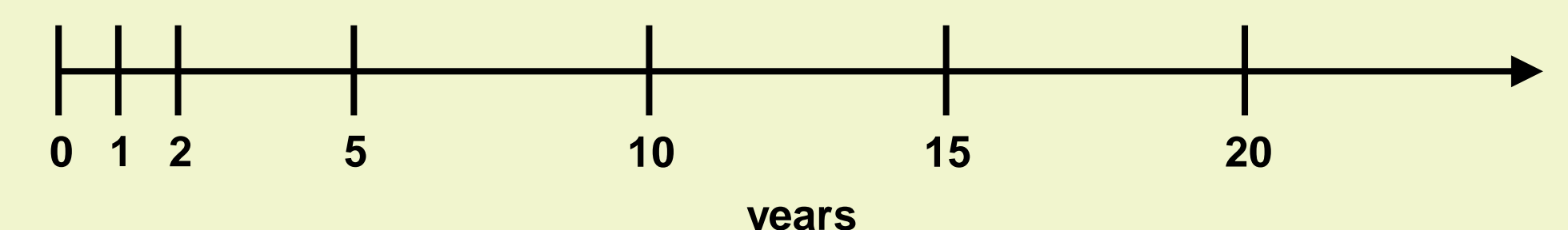


Management

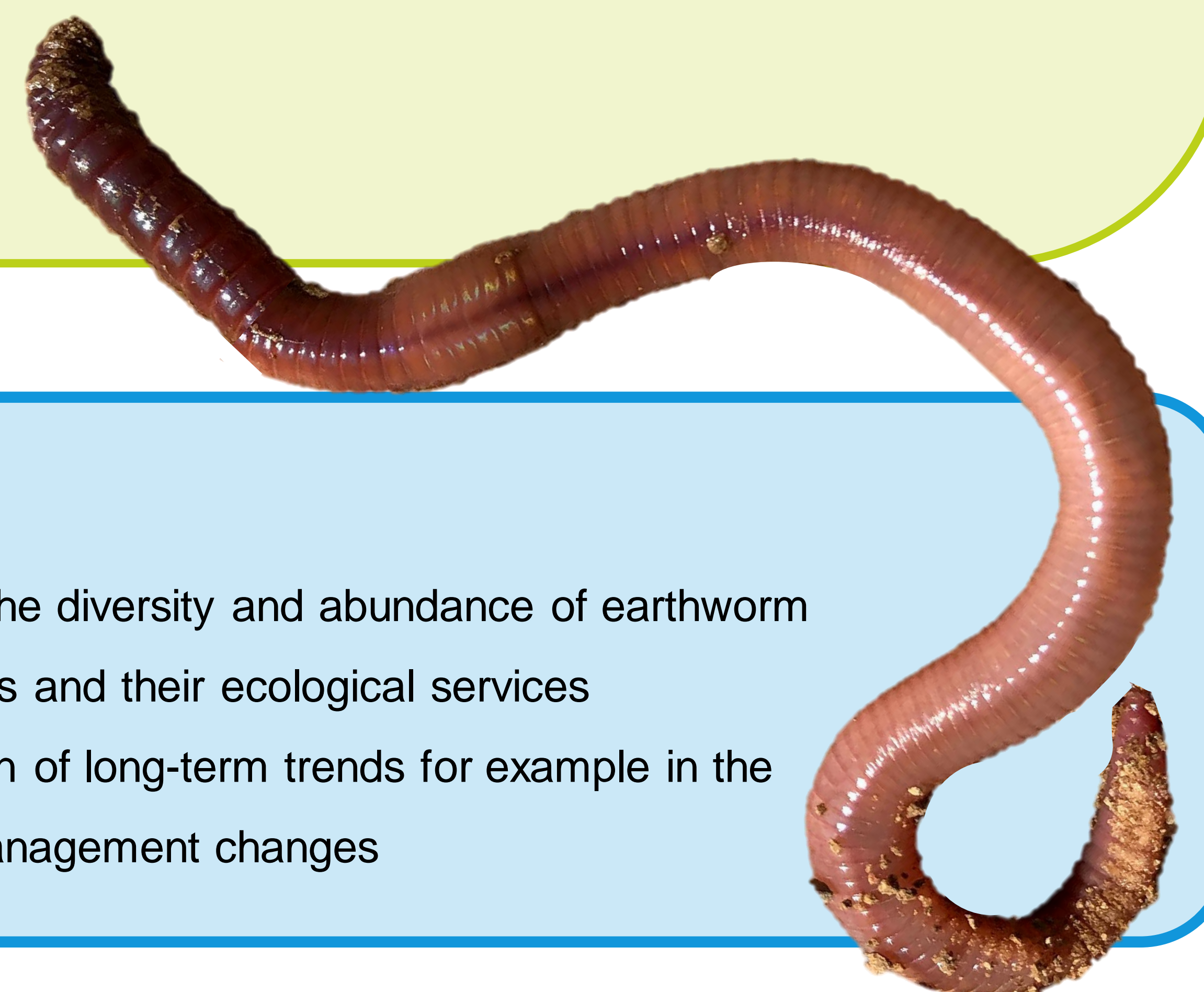
- Tillage
- Crop rotation
- Fertilization
- Farming system
- Mulch and straw management



Sampling design

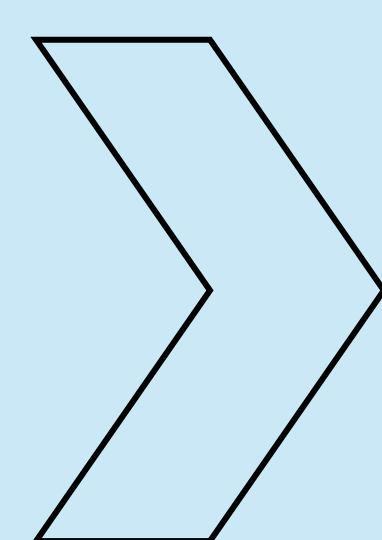


- Sampling for 3 consecutive years at the start, afterwards at 5 year interval
- Parallel sampling of earthworms and influencing factors
- n = 112 (28 per Region)



Output

- Development of a cost- and personnel-effective monitoring concept
- Basis for a national trend monitoring of earthworm diversity



- Effects on the diversity and abundance of earthworm communities and their ecological services
- Identification of long-term trends for example in the event of management changes