

Hungarian National Laboratory for Health Security project – aims and results of the Division of Invasion Biology

RRF-2.3.1-21-2022-00006

**Invasive Alien Species in the Danube Region:
IAS of Regional Concern**

LÁSZLÓ ZSOLT GARAMSZEGI

**INVÁZIÓ–
BIOLOGIAI**
D I V Í Z I Ó

Mission

ASSESSMENT AND FORECASTING OF THE ECOLOGICAL, ECONOMIC, AND SOCIAL IMPACTS OF INVASIVE ANIMAL AND PLANT SPECIES EMERGING AND/OR SPREADING IN HUNGARY

THE FORMULATION OF PRACTICAL RECOMMENDATIONS FOR PROTECTION AGAINST INVASIVE SPECIES AND FOR THE PREVENTION AND MITIGATION OF THE DAMAGE THEY CAUSE.

ECOLOGICAL EFFECTS

HYBRIDIZATION WITH NATIVE SPECIES

COMPETITION WITH NATIVE SPECIES

PREDATION

SPREAD OF PATHOGENS (AS VECTOR OR RESERVOIR SPECIES)

IMPACTS ON SPECIES COMPOSITION AND ECOSYSTEM FUNCTIONING

DECLINE IN BIODIVERSITY

SOCIETAL EFFECTS

PUBLIC AND ANIMAL HEALTH

- Epidemics
- Toxic metabolic by-products
- Allergens

FORESTRY AND AGRICULTURE

- Competition with crops/livestock
- Predation on crops/livestock
- Spread of pathogens and diseases
- Spread of harmful metabolites

ECOSYSTEM SERVICES

- Pollination
- Soil functions
- Ecotourism

Coypu



Prairie dropseed



Blanket flower



Citrus flatid planthopper



Common milkweed



Asian tiger mosquito



Cottony cushion scale



Raccoon



WORK PACKAGES

1. **DOCUMENTATION AND MAPPING OF INVASION EVENTS AND DISTRIBUTION**
2. **UNDERSTANDING MECHANISMS OF INVASION PROCESSES AND THE CAUSES OF INVASION**
3. **UNCOVERING THE ECOLOGICAL CONSEQUENCES OF INVASIVE SPECIES ON NATIVE SPECIES, ENDEMIC COMMUNITIES AND ECOSYSTEM FUNCTIONING**
4. **ASSESSING THE EFFECTS OF INVASION ON SOCIETIES AND ECONOMY**
5. **PREDICTING FUTURE DISTRIBUTION AND EFFECTS OF INVASIVE SPECIES**
6. **DEVELOPING THE CONCEPTS OF DEFENCE PROGRAM AGAINST BIOLOGICAL INVASION**

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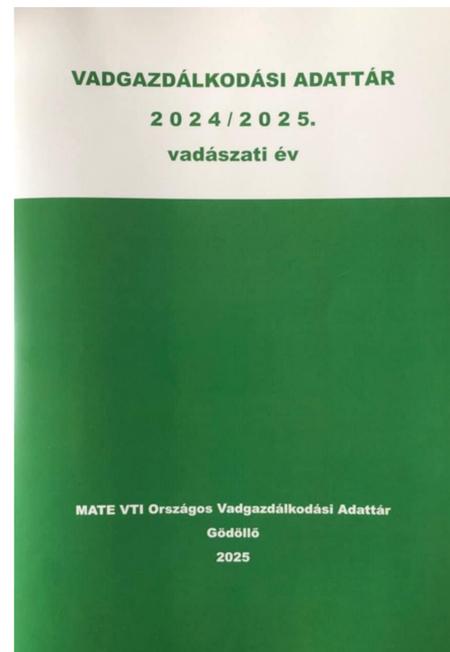
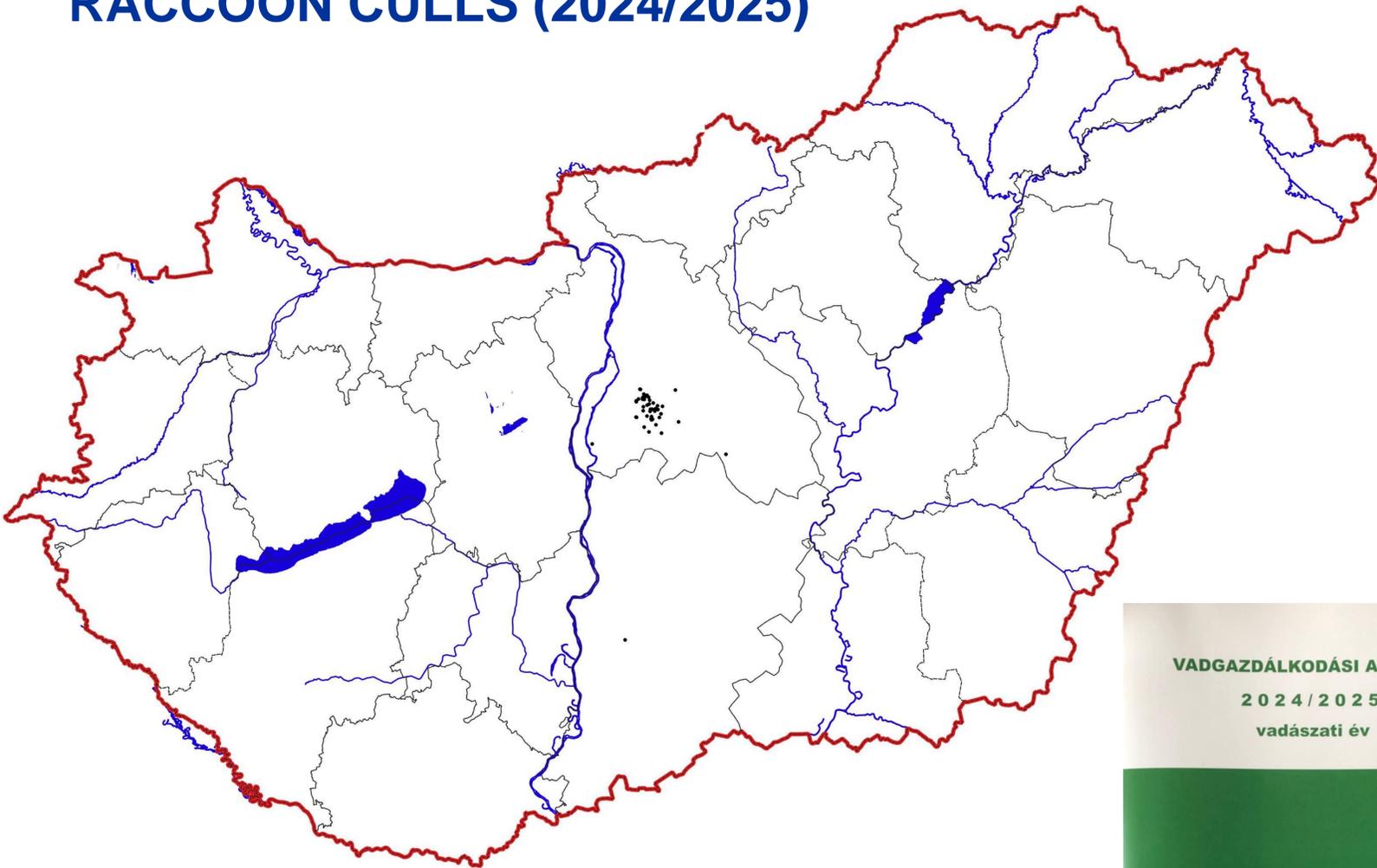
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Collection of national wildlife management data and citizen science data

REPORTING WEBSITE
<https://invazivadak.uni-mate.hu>

RACCOON CULLS (2024/2025)



ANNUAL WILDLIFE MANAGEMENT DATA

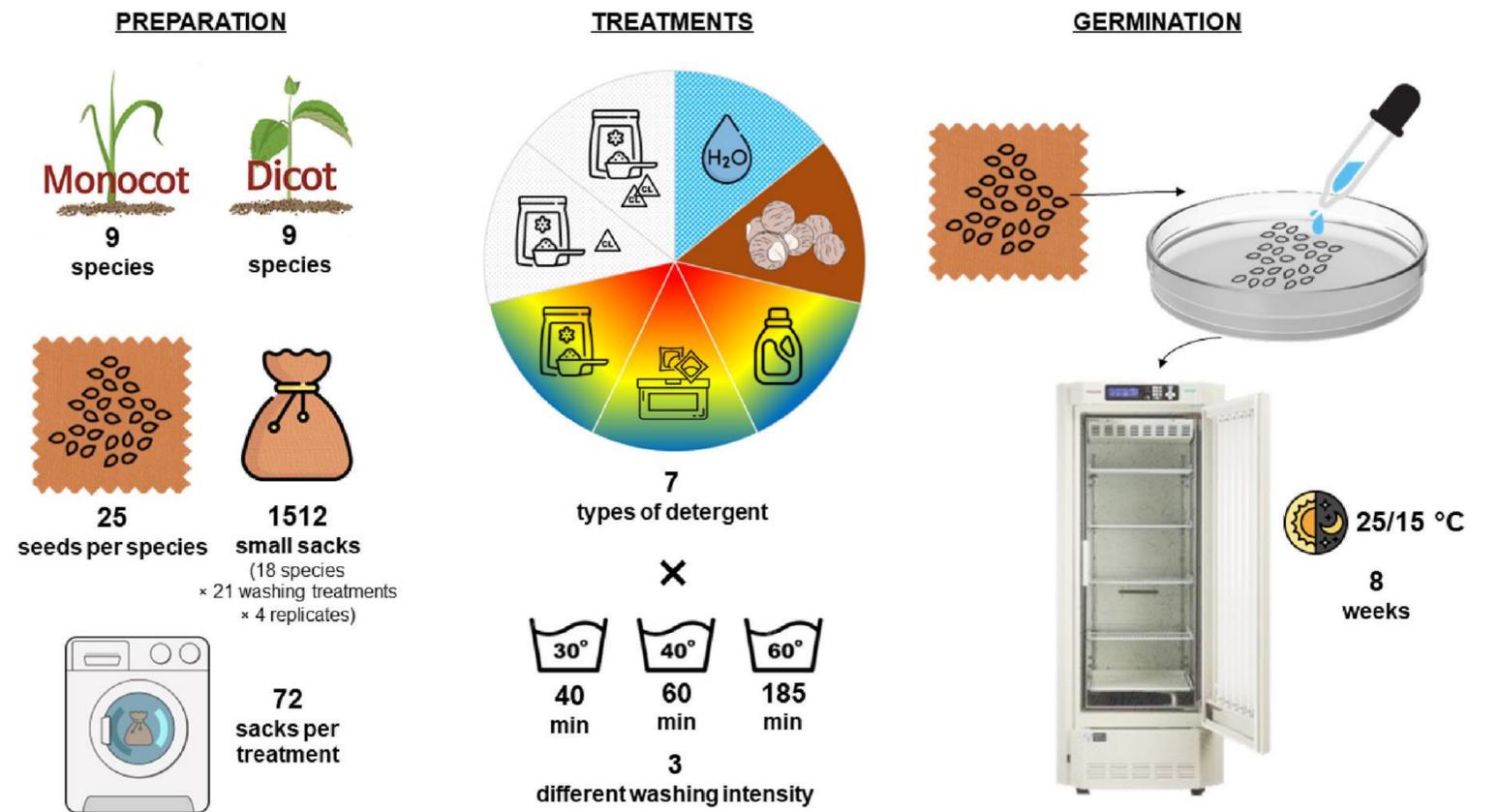
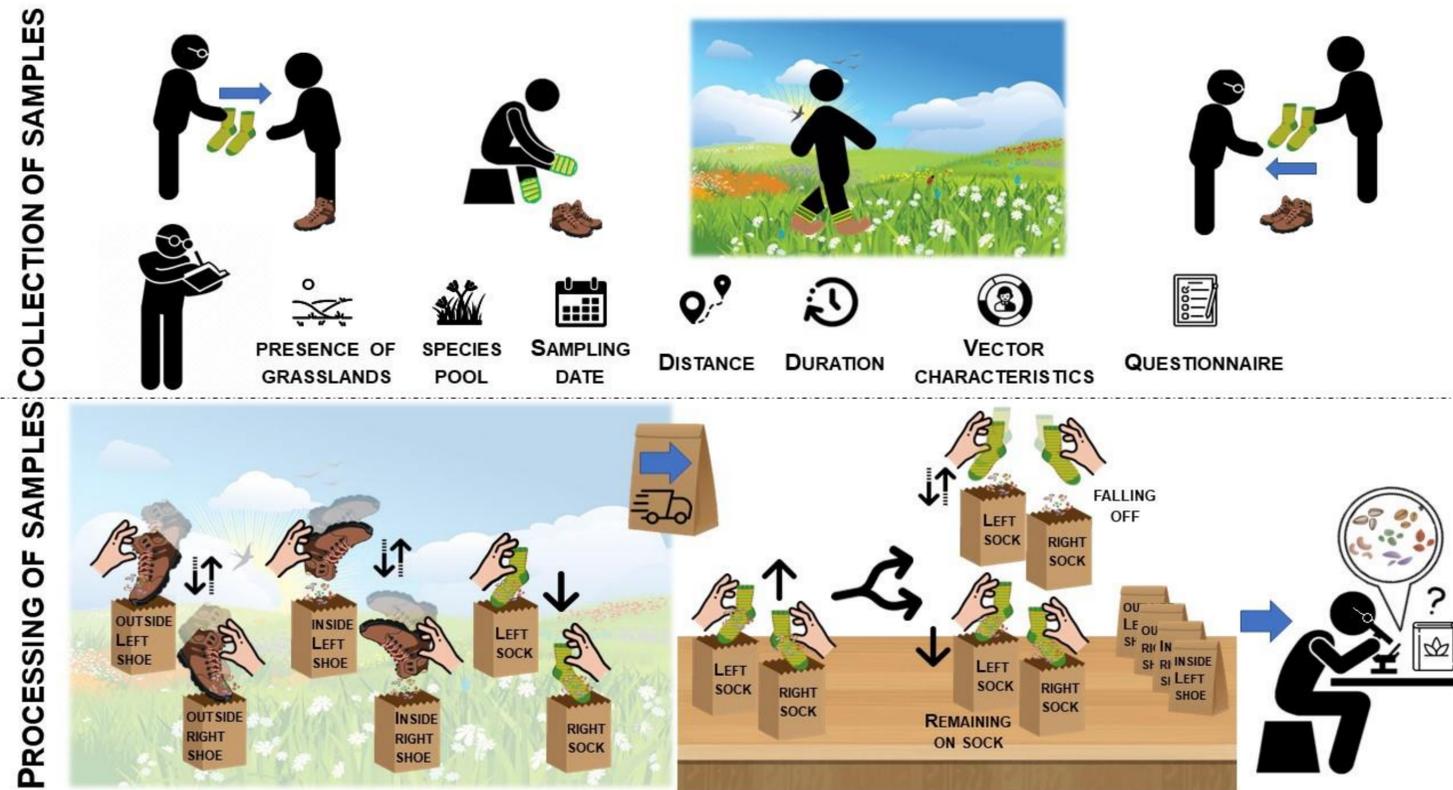
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Spread via human clothing

MANY FAST-SPREADING AND INVASIVE SPECIES ARE EFFECTIVELY DISPERSED VIA CLOTHING

ESTABLISHMENT DYNAMICS AND CONTROL: THE ROLE OF TEMPERATURE AND DETERGENT



ERC Advanced Grant – Step 2 (interjú: 2026. márc.)
 Lukács et al. 2023 Sci. Total Environ.
 Lukács et al. 2025 J. Env. Manage

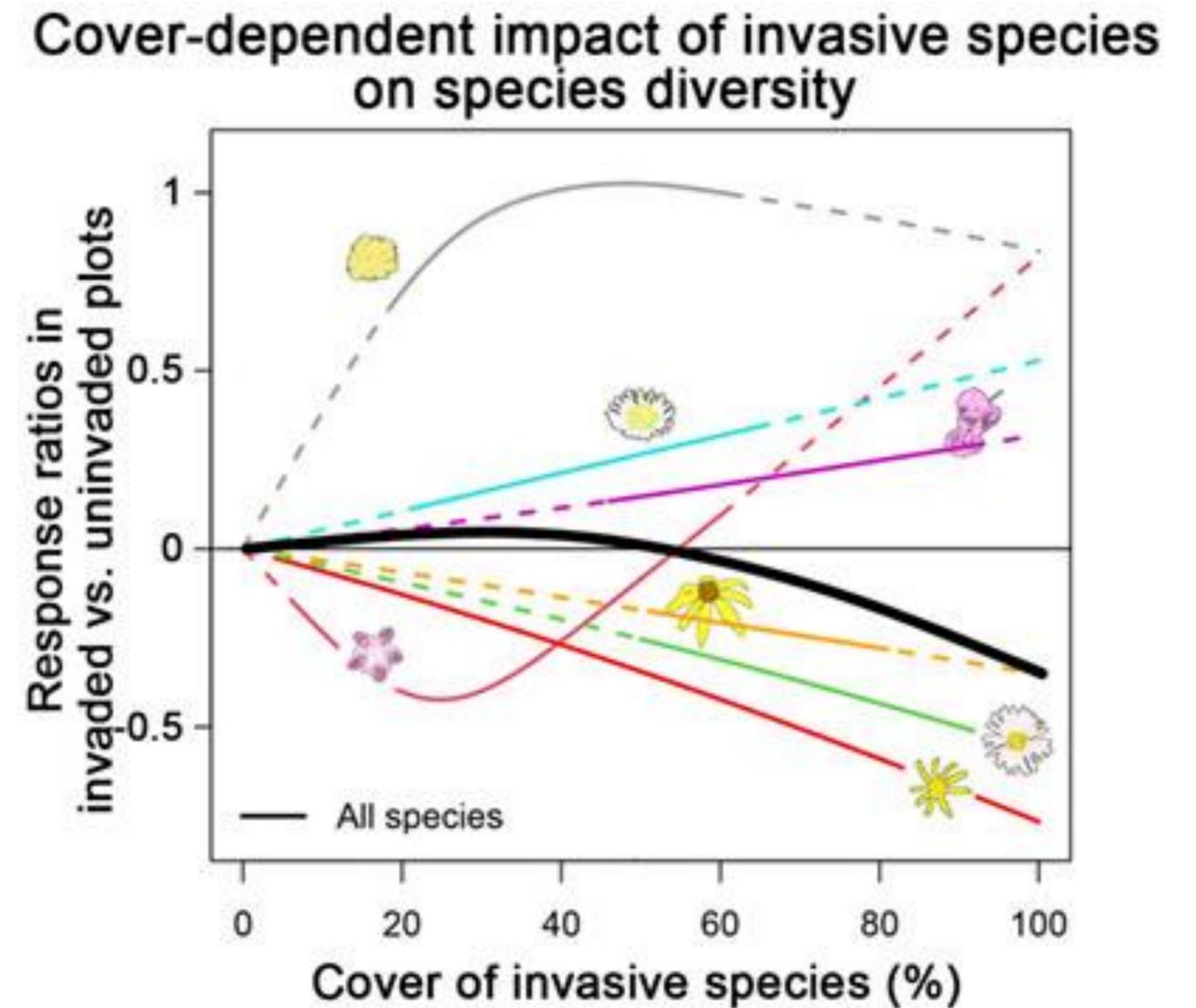
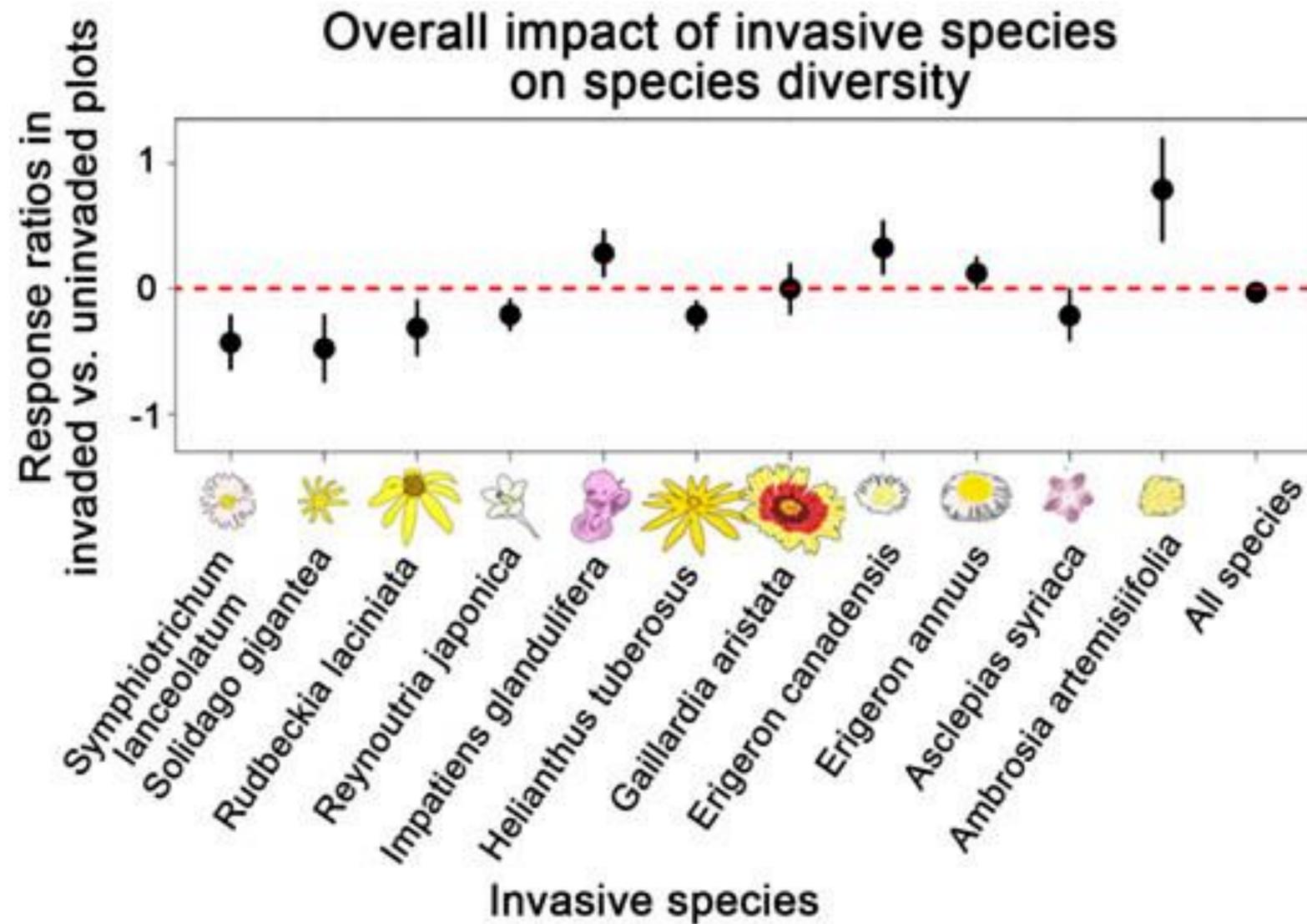
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Impacts of 11 invasive plant species

FUNCTIONAL CHANGES IN VEGETATION



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Social and economic impacts of the beaver

IDENTIFICATION AND MANAGEMENT OF HUMAN-NATURE CONFLICTS

REGISTRATION (MAPPING AND DOCUMENTATION) OF WETLANDS CREATED BY BEAVERS



Czabán, D., & Juhász, E. (2024). European Journal of Wildlife Research
Kanizsay et al. (2025). Természetvédelmi Közlemények

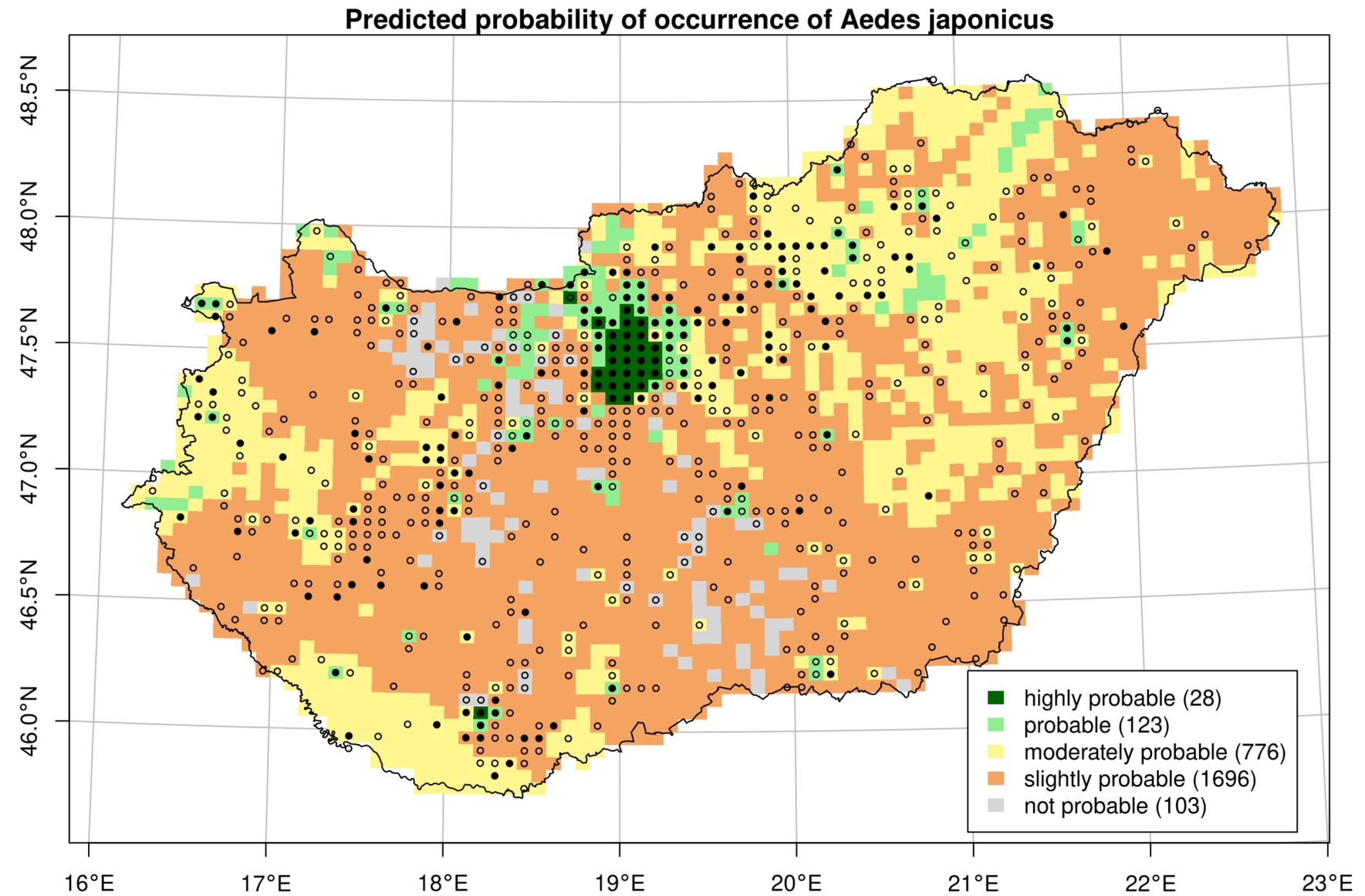
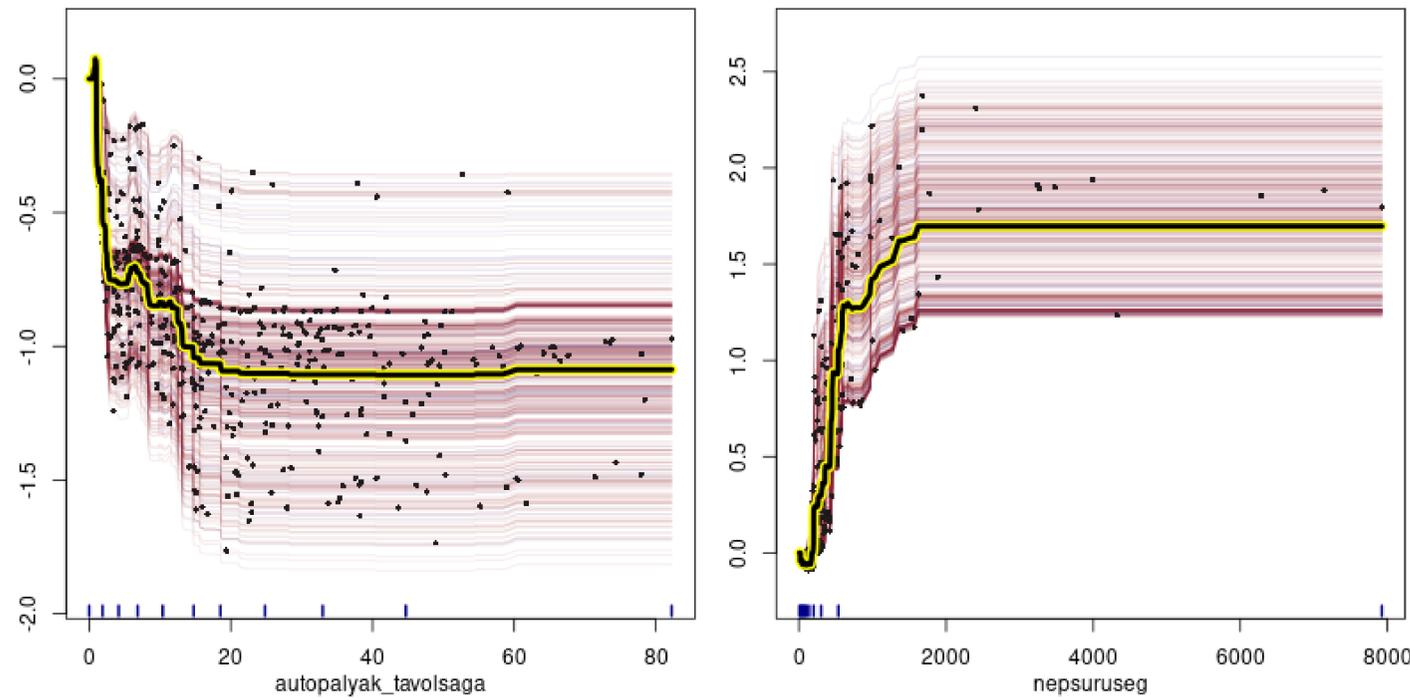
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Invasive mosquito species

PREDICTIVE MODELING BASED ON ENVIRONMENTAL VARIABLES



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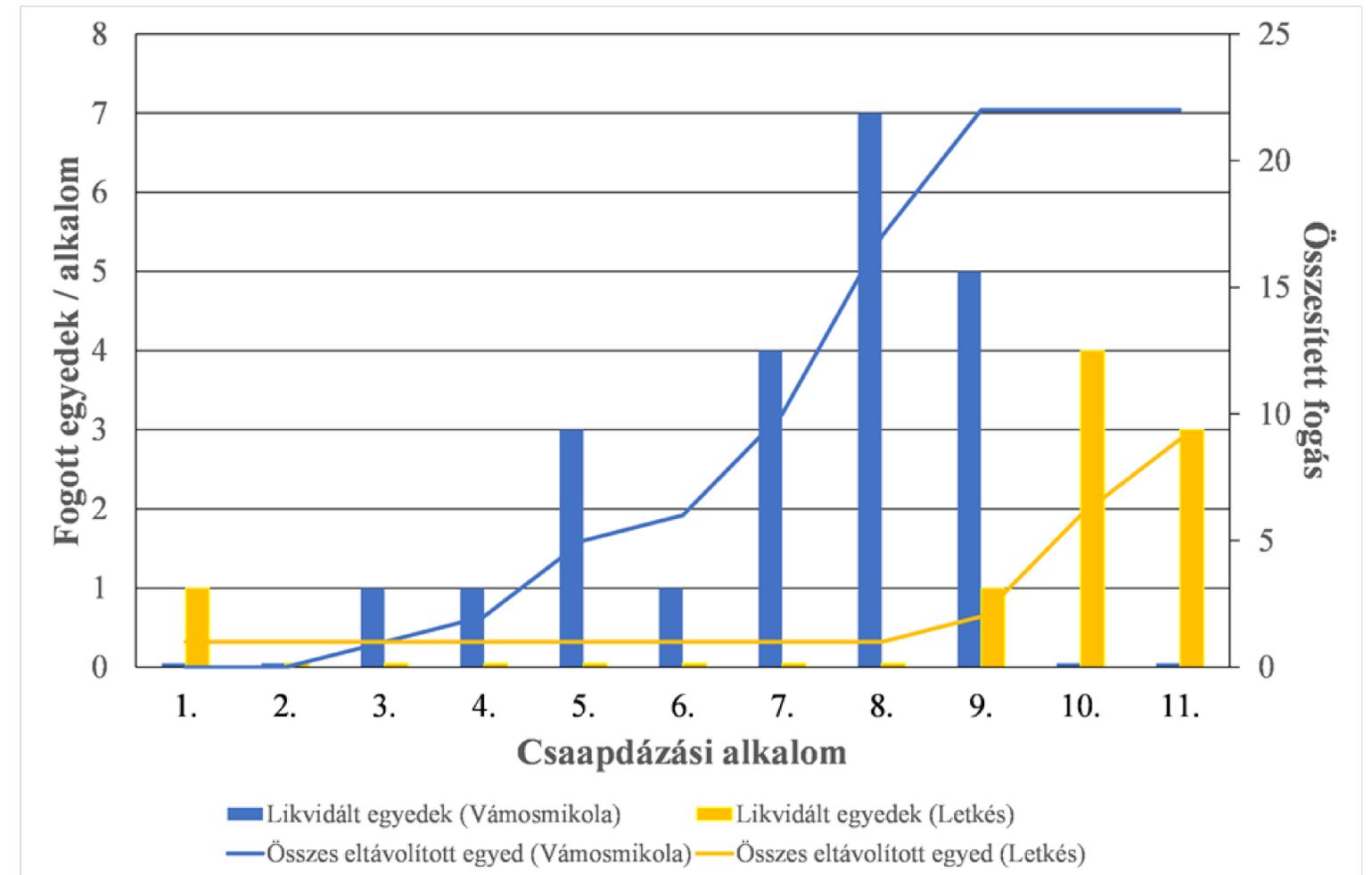


Control of invasive mammal species

POPULATION CONTROL THROUGH TRAPPING



CHANGES IN NUTRIA CAPTURE FREQUENCY





Control of Invasive mosquito species



TARGET SPECIES

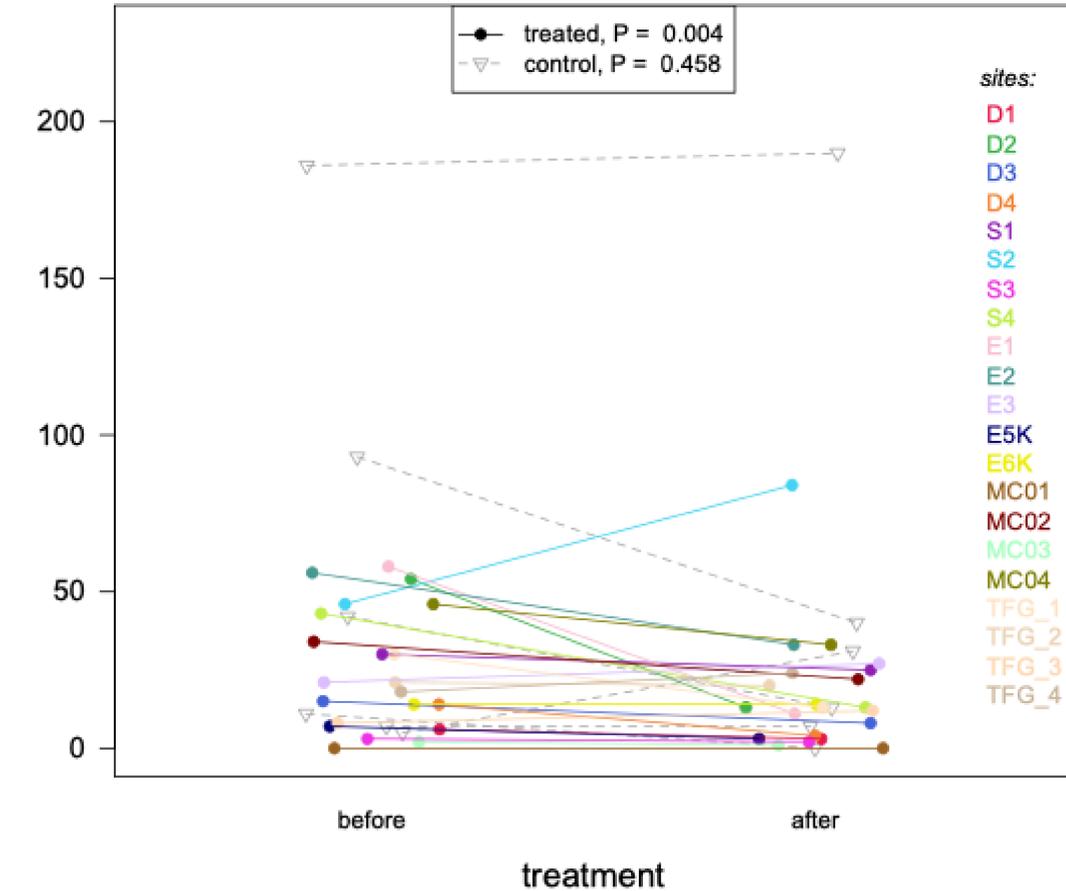
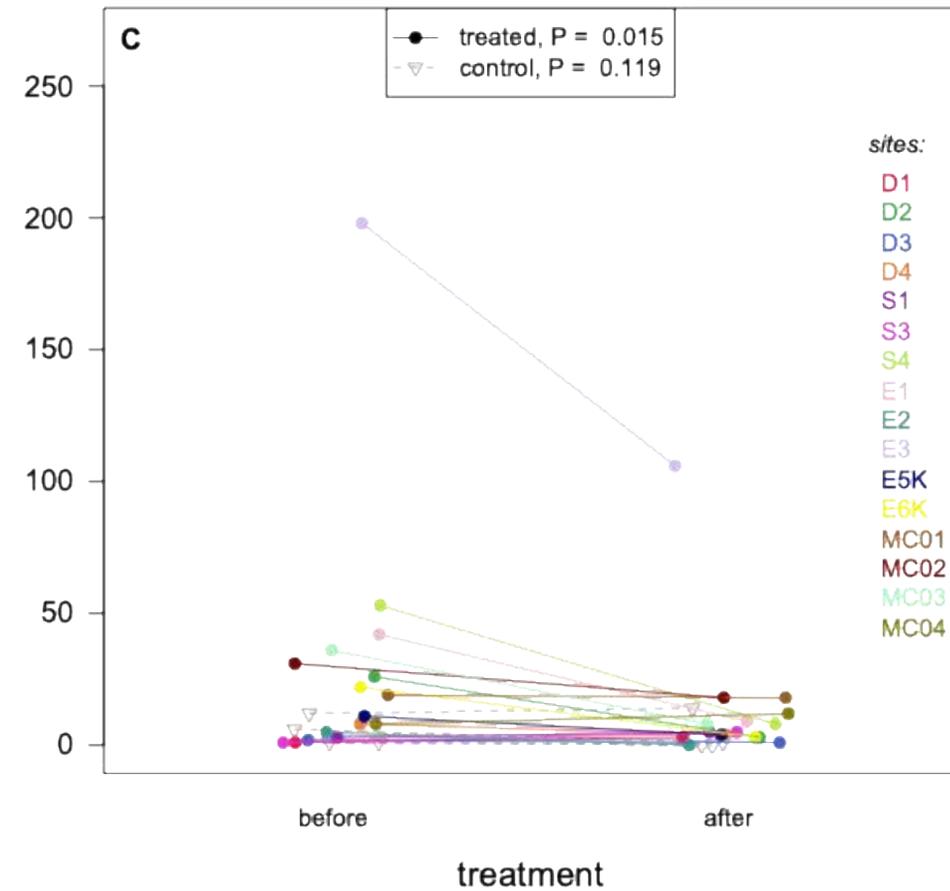
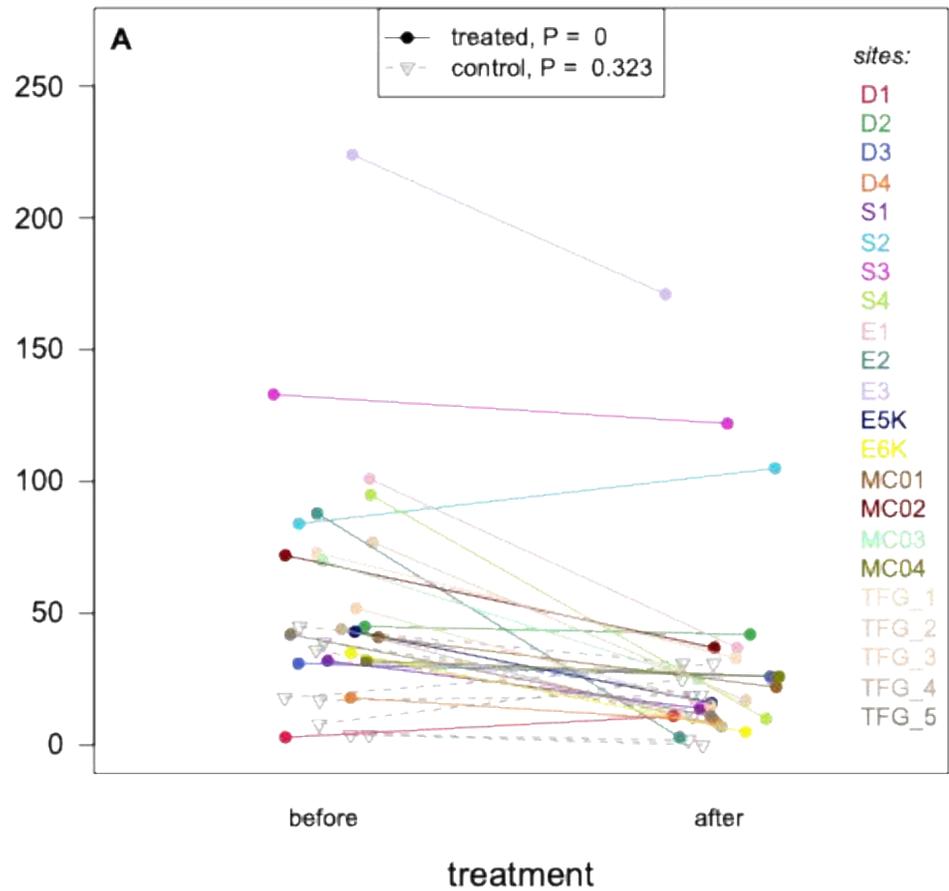
NON-TARGET SPECIES

All mosquitoes

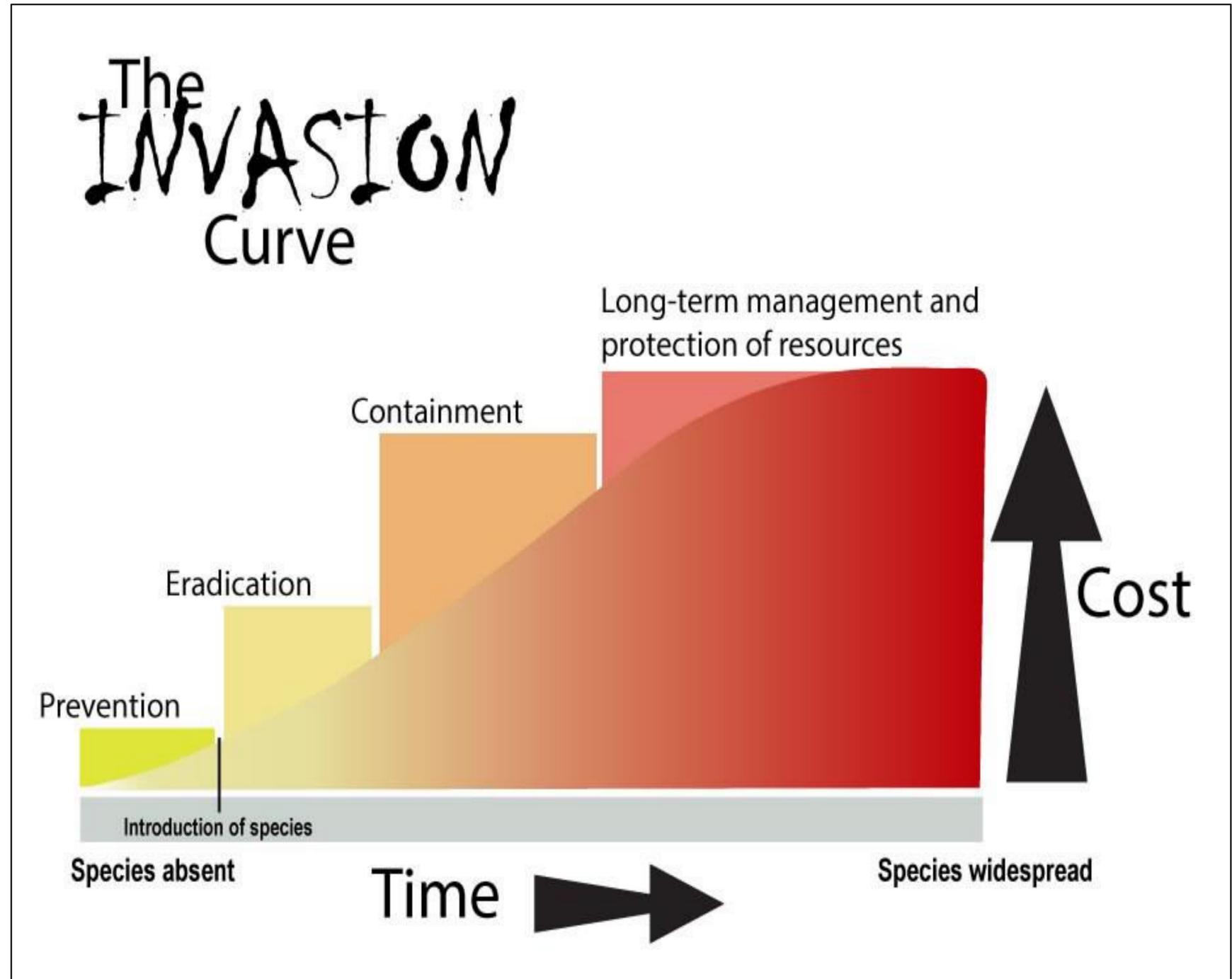
Invasive mosquitoes

Pollinators (malaise trap)

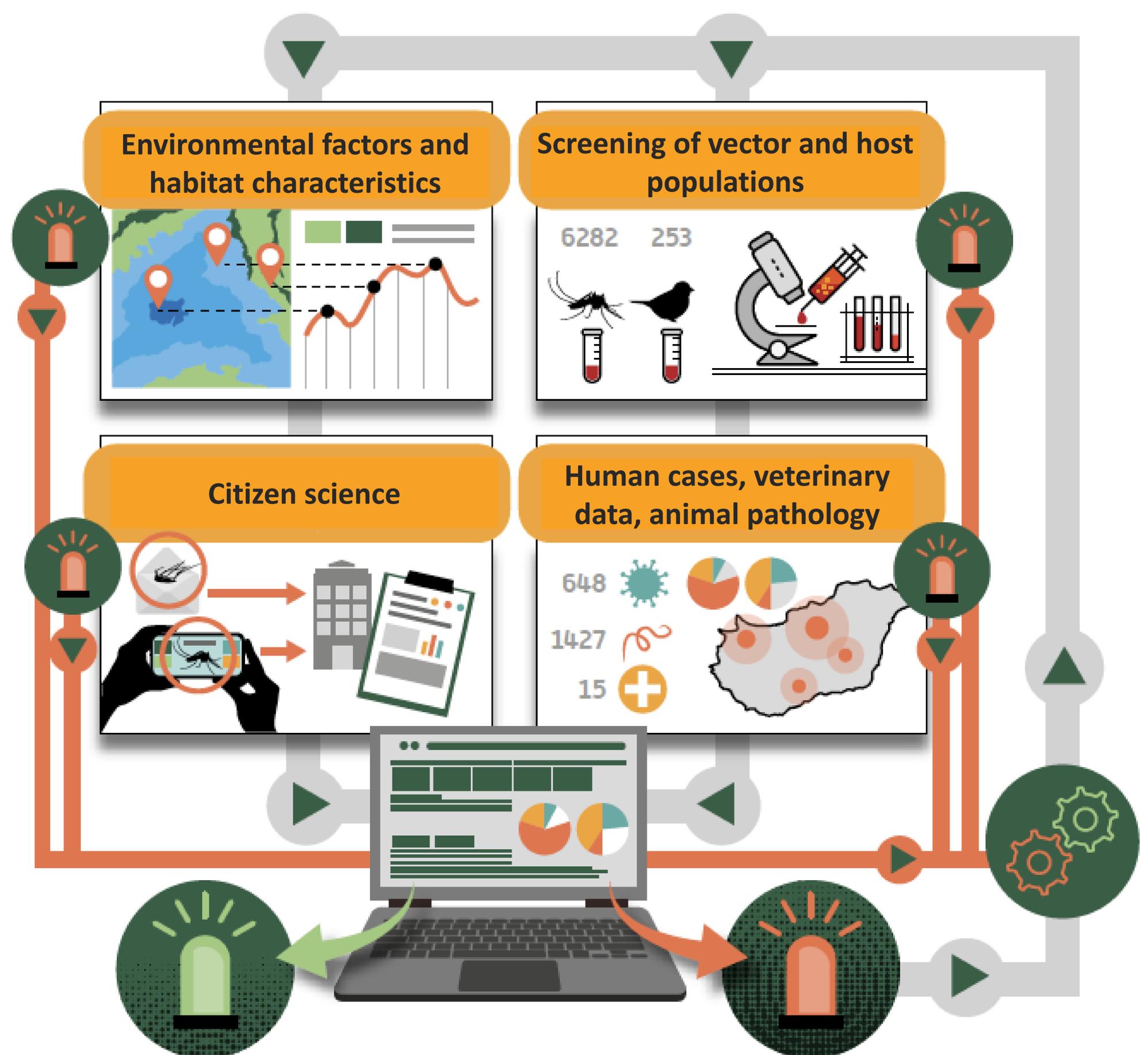
individuals



1. Biological invasions are becoming increasingly frequent
2. Biological invasions cannot be fully prevented

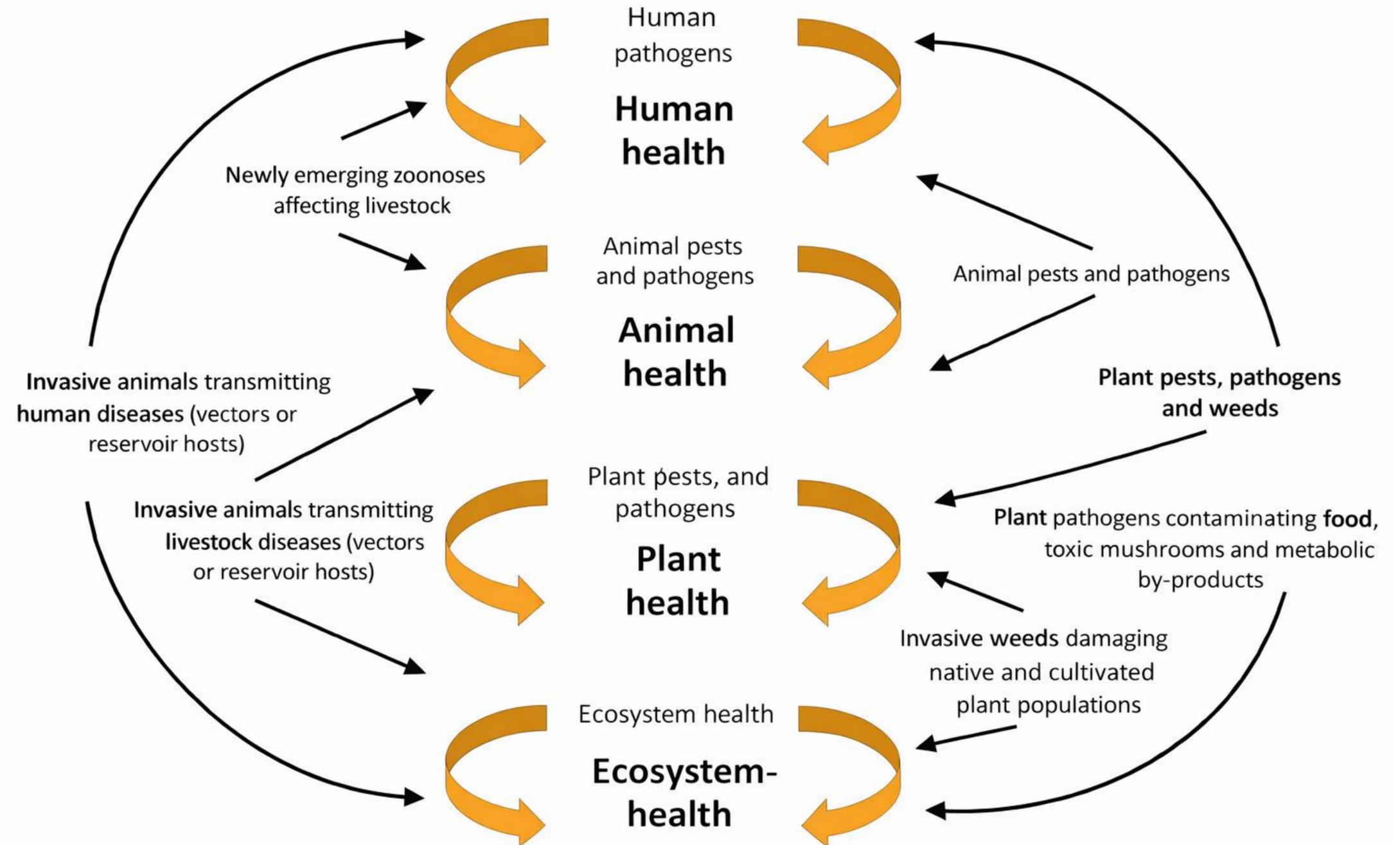


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3. Integrated data collection: mapping invasion processes and their impacts

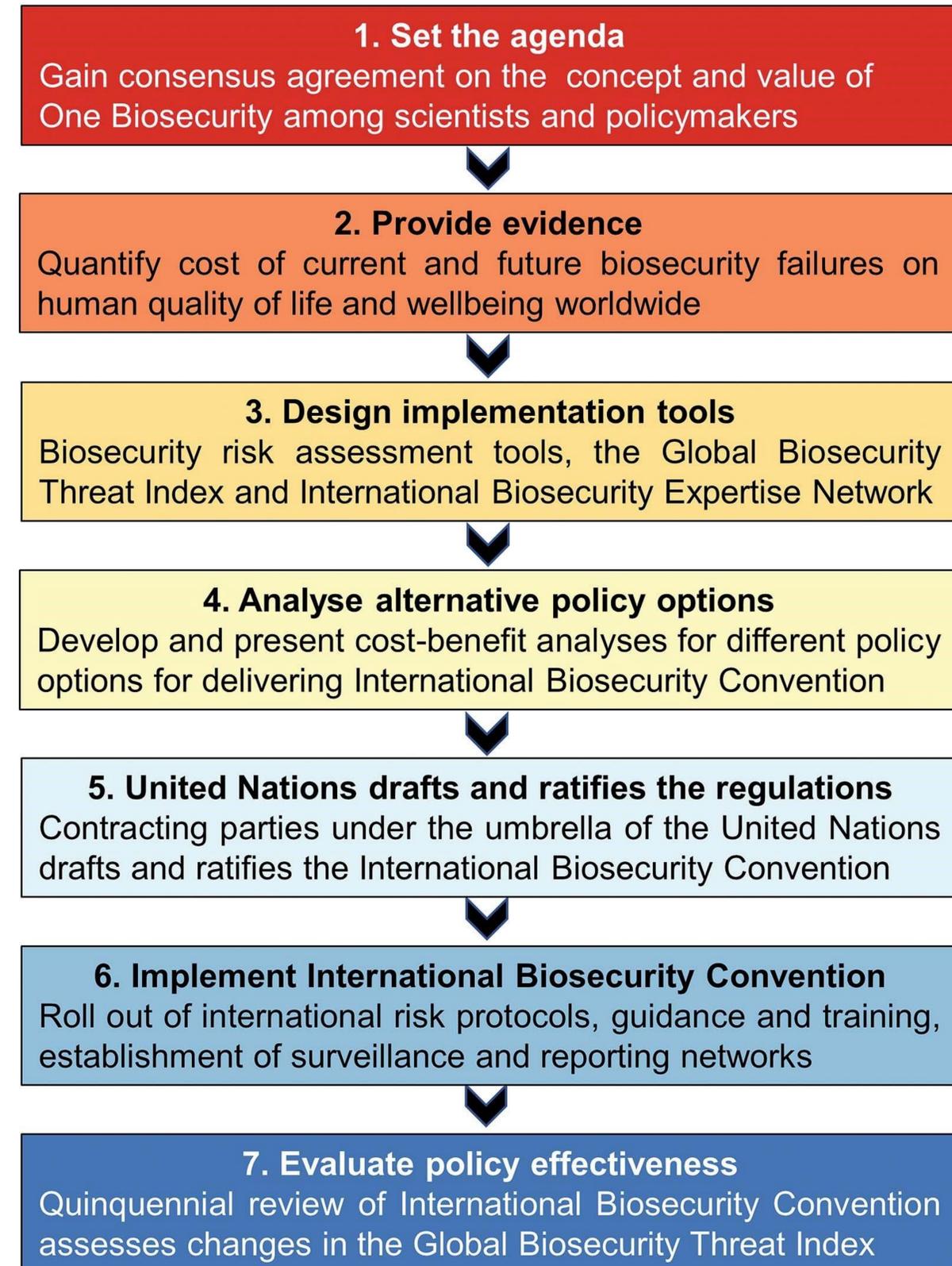


One biosecurity

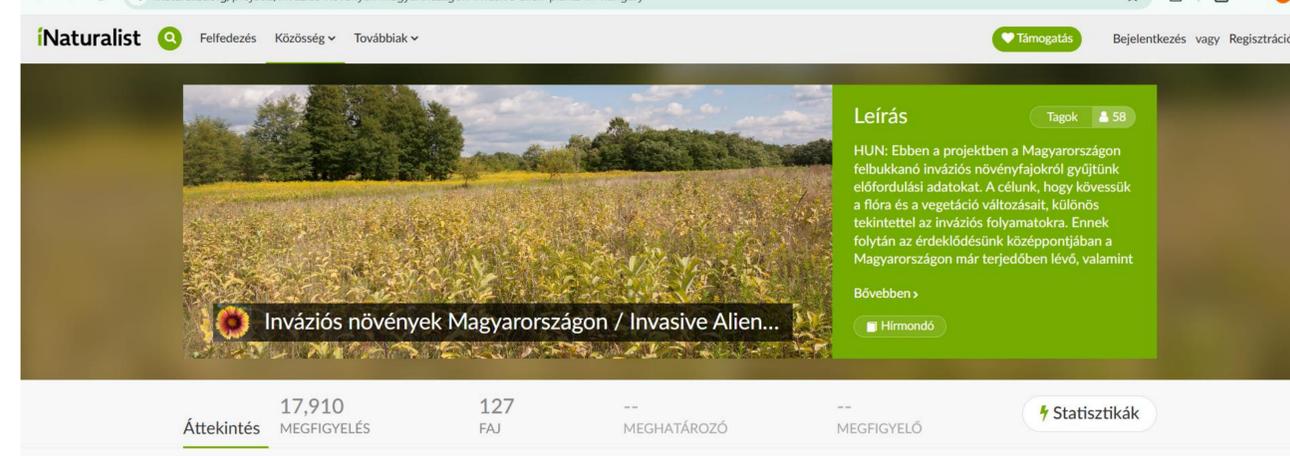
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5. Priority species lists and action plans
6. Public awareness raising and engagement



Citizen science projects



Thank you for your attention!