

Multi-species occupancy modeling of ground-dwelling mammals in central Laos: a case study for monitoring in tropical forests

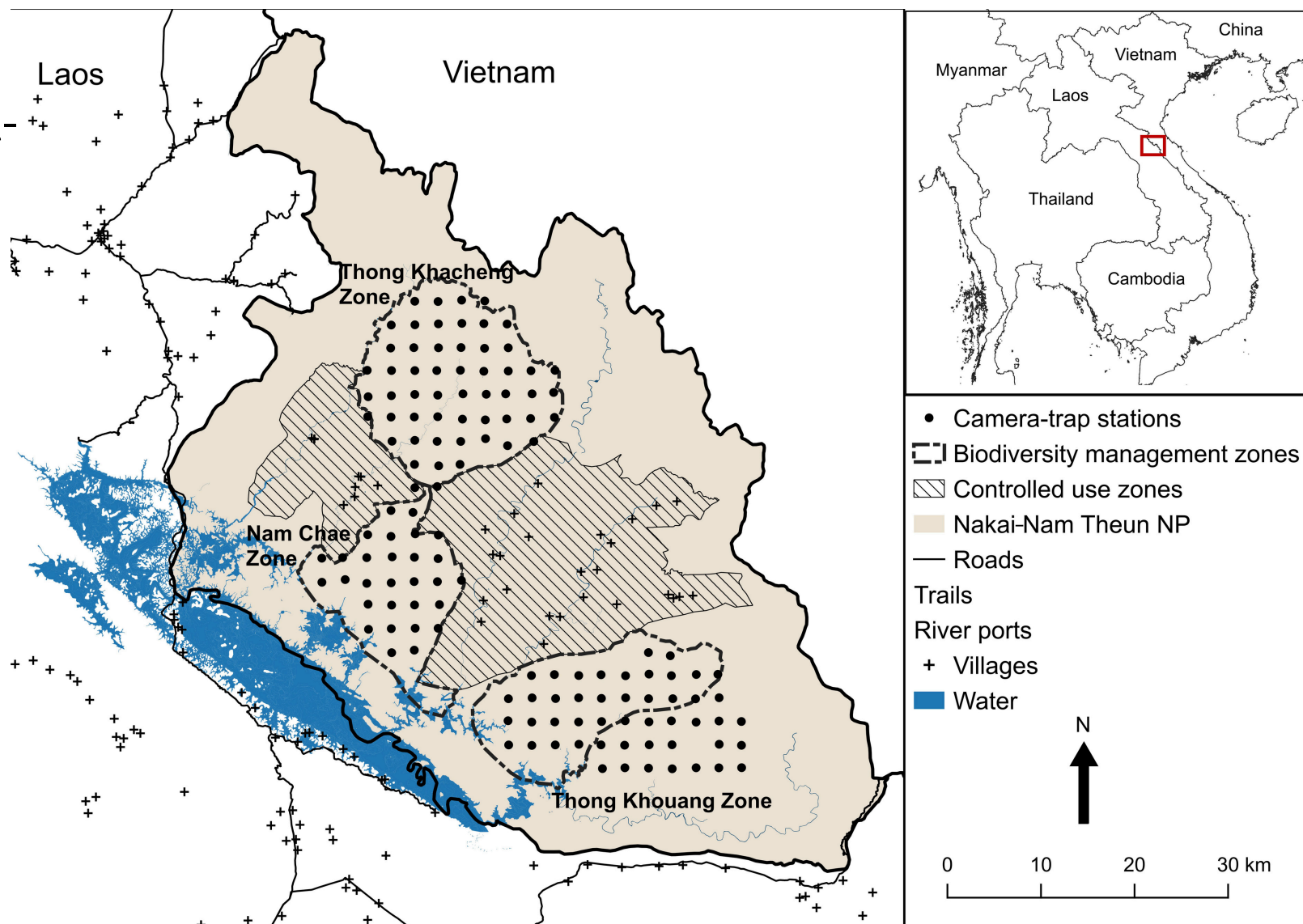
Ioannis Alexiou · Camille N. Z. Coudrat · Jürgen Niedballa · Andreas Wilting · Andrew Tilker. 2024. *Wildlife Biology*

INTRODUCTION

- The **tropical forests of mainland Southeast Asia** are among the **most biodiverse and threatened** forest systems globally
- **Unsustainable hunting and habitat loss** have led to **widespread mammal population declines in Southeast Asia**
- **Robust monitoring of population trends over time and space** is a **key component of national park management strategy**
- **Systematic camera trap surveys** are the best method for population monitoring of terrestrial forest mammals
- **Multi-species occupancy models** provide robust estimates of species occurrence, abundance, richness and distribution at the community level

METHODOLOGY

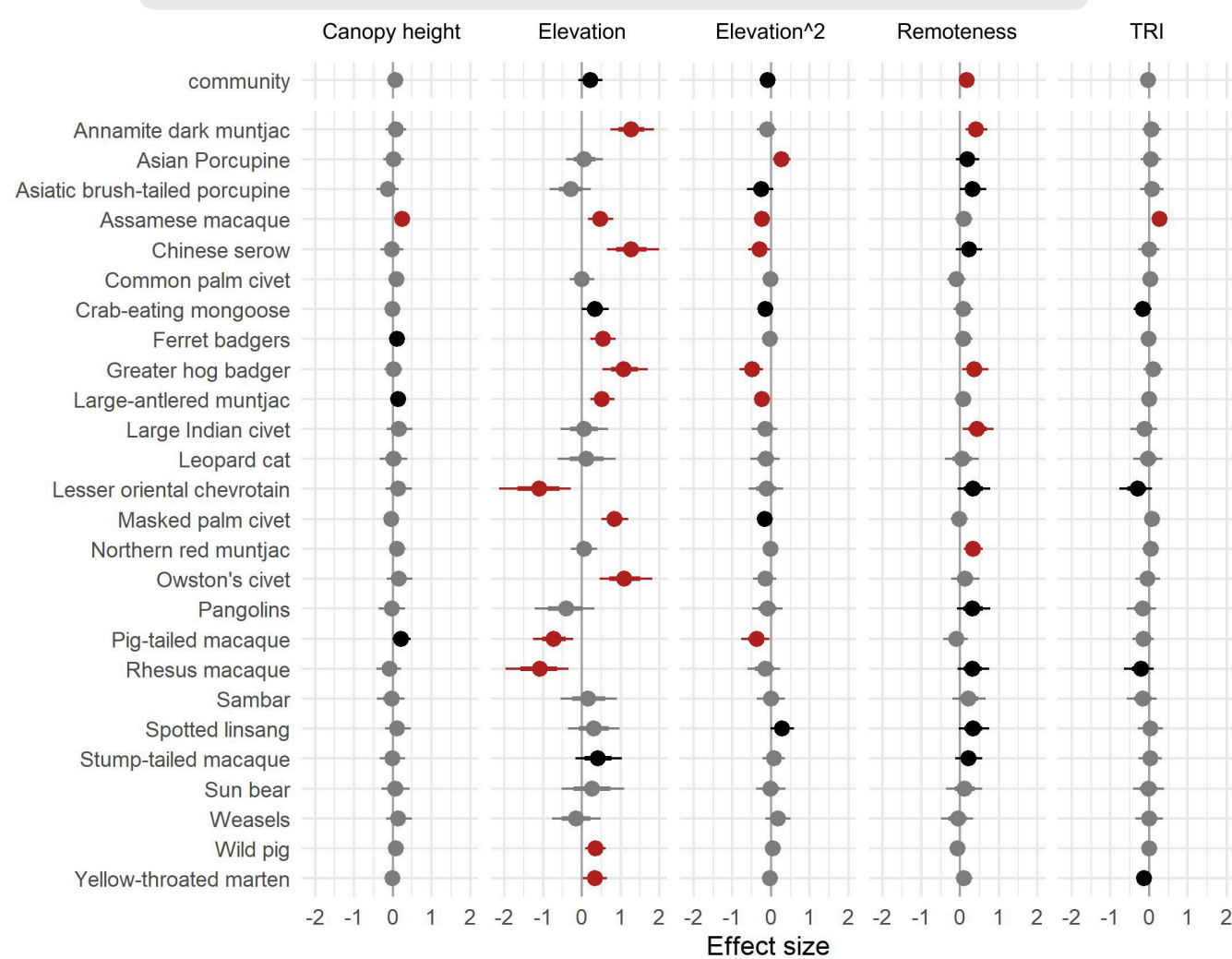
- **Landscape-scale systematic camera-trapping survey in Nakai-Nam Theun National Park in 2020** (20,794 camera-trap days for 131 operational stations 255 cameras)
- A multi-species occupancy analysis
- **Objectives:**
 - **Estimate occupancy and species richness** within **three Biodiversity Priority Zones**: Nam Chae, Thong Kacheng, Thong Kouang
 - Assess anthropogenic and ecological **factors influencing species distribution** in the national park
 - Establish this methodology as part of the **long-term wildlife monitoring program** for the national park



MAIN FINDINGS

- Total of **40 terrestrial mammals** were detected, including **5 Annamite endemics** and **18 threatened species**
- **28 species** with **sufficient detections** to be included in the **multi-species occupancy analysis**
- **Overall species richness increased with remoteness and elevation**
- mean (SD) **predicted species richness**:
 - Thong Kacheng Zone: 14.6 (\pm 1.55)
 - Thong Kouang Zone: 13.2 (\pm 1.64)
 - Nam Chae Zone: 11.8 (\pm 1.15)

COVARIATE EFFECTS ON SPECIES OCCUPANCY PROBABILITY

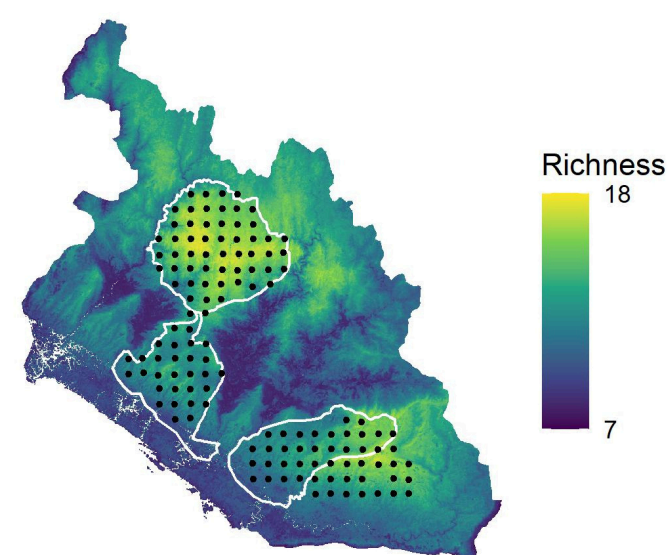


CONCLUSIONS

- Nakai-Nam Theun National Park is a **priority area for biodiversity conservation in the Annamites**
- The national park holds **globally significant populations of Annamite endemics**, including **two of some of the largest remaining populations in the world** of Endangered **Owston's civet** and Critically Endangered **Large-antlered Muntjac**
- This **wildlife monitoring program** with a **systematic large-scaled camera-trap survey** should be **replicated in the long-term every 3-5 years** as part of Nakai-Nam Theun National Park management strategy

SPECIES RICHNESS IN NAKAI-NAM THEUN NATIONAL PARK FOR THE SELECTED SPECIES

CAMERA-TRAPPING STATIONS AND DELINEATION OF THE THREE BIODIVERSITY MANAGEMENT ZONES



BOXPLOTS SHOWING SPECIES RICHNESS ACROSS THE THREE ZONES

