

CONTEXT MATTERS:

Post-fledging movements and survival
in juvenile European Blackbirds along
an urban-forest gradient.

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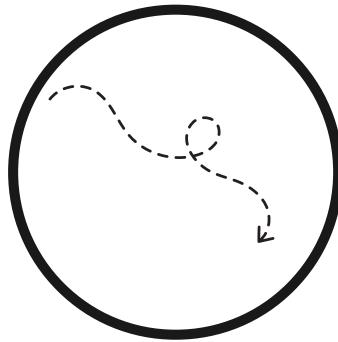
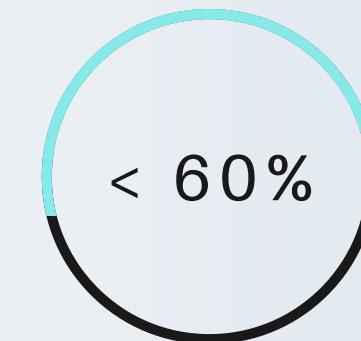
²Keele University, Staffordshire, United Kingdom

BACKGROUND



Post-fledging is a period that involves **when** to leave, **how** to move, and **where** to settle down, decisions that can have long-lasting effects.

Among life stages, juvenile birds experience the highest mortality rate.



Different environments present different resources, risks, and challenges that can alter fledgling movement, settlement, and survival.

Despite its significance, it remains scarcely documented in many avian taxa.



OBJECTIVES



To quantify post-fledging
movement patterns across
stages of the post-fledging
period and along an
urbanization gradient.

To estimate survival rates
across stages and areas
(urban - forest).

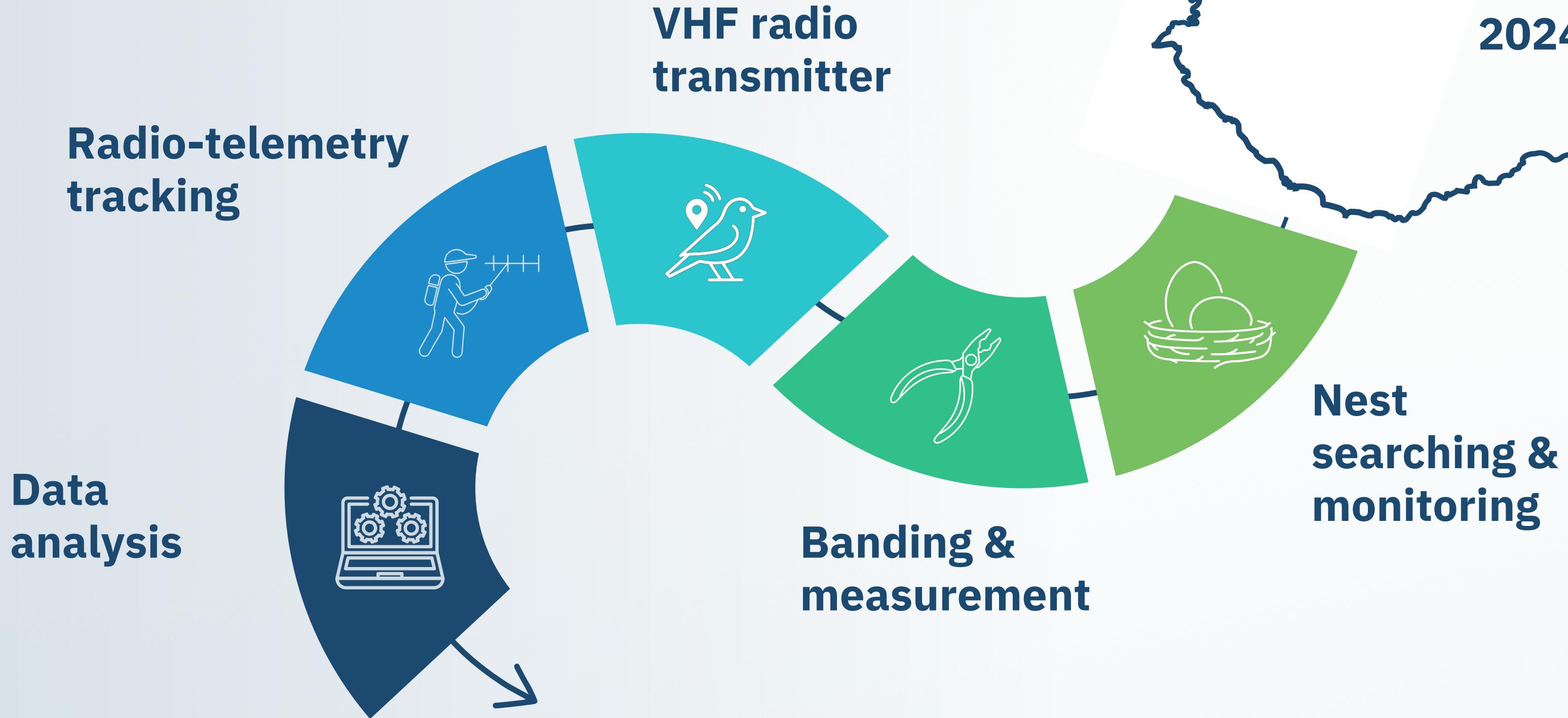
To evaluate the influence
of biological covariates on
movement and survival.

ABOUT BLACKBIRDS

- Widespread, abundant across Europe.
- Thrives in both urban and forested habitats.
- Responds to urbanization and habitat structure.
- Juvenile stage remains understudied (post-fledging period).



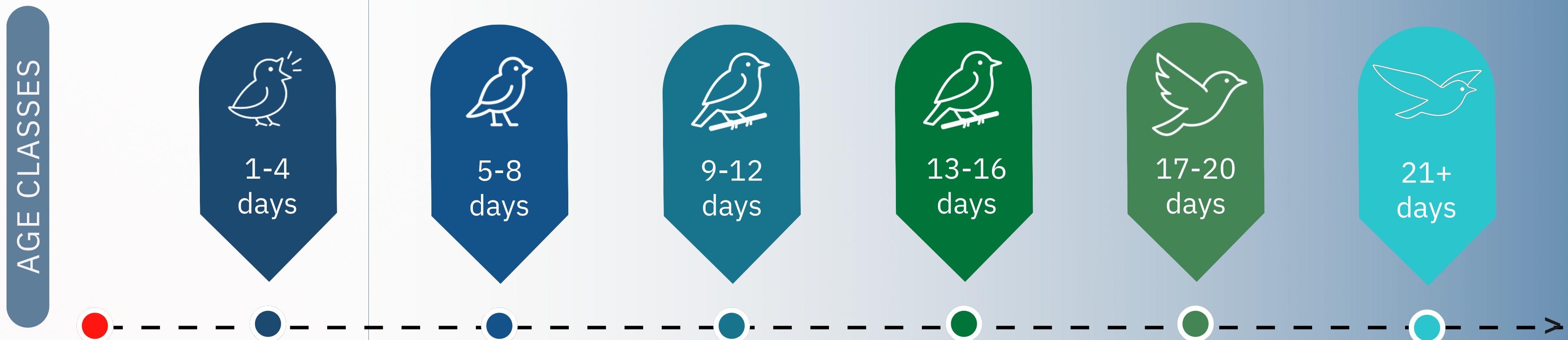
METHODS



Debrecen, HU
2024 - 2025



PCA $\left\{ \text{Nearest sidewalk} + \text{Nearest building} + \text{Nearest road} + \text{Green Cover} \right\}$ = **Urbanization Score**



Fledging
day

Early
dependence

Developing
mobility

Exploratory
phase

Increasing
independence

Transition
phase

Late post-
fledging

METHODS

Survival

Capture-recapture models
in RMark

Model selection via QAIC
→ Covariates: area, age
class



Post-fledging movements

Generalized Linear
Models (GLMs)

→ Daily movement as
response variable

→ Urbanization score,
age, sex & area as
predictors.

Daily Movement by Age Class (2024-2025)

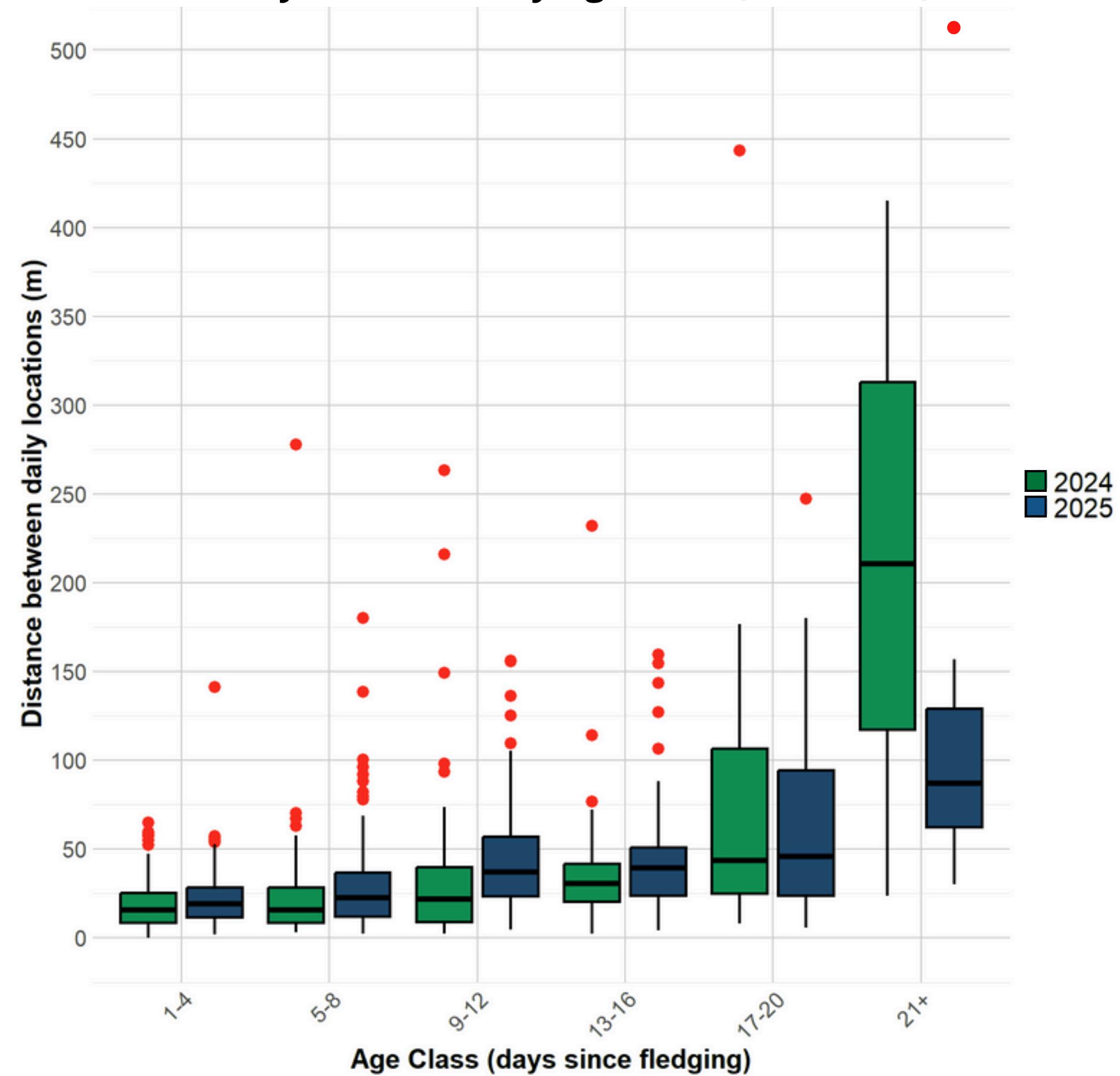
RESULTS

Daily Movements

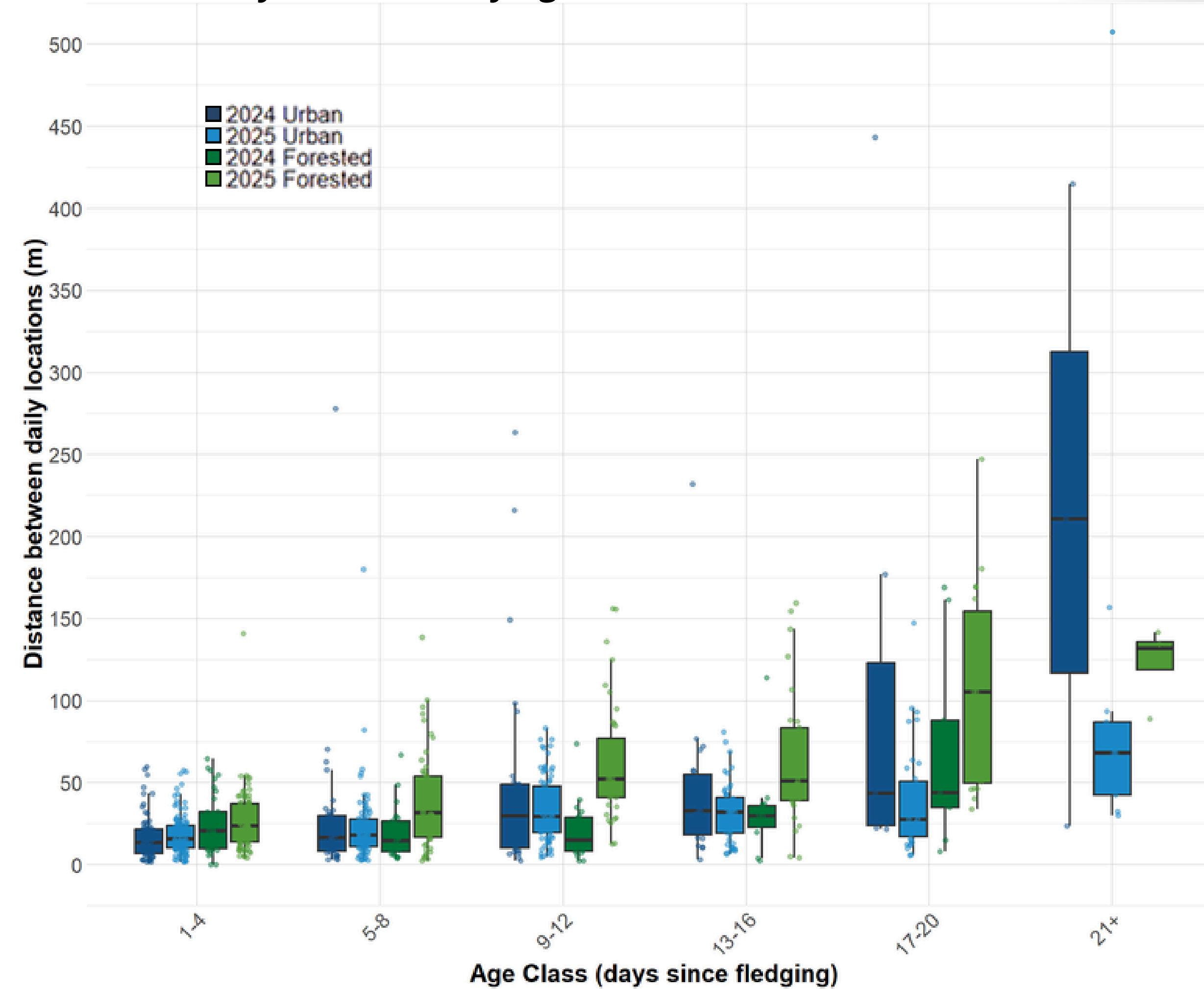
100 tracked fledglings from 33 different broods.

Age class had a significant effect on daily movements distances ($p<0.001$).

Daily distances increased along age classes, averaging 28.32m among them.



Daily Movement by Age Class across Areas and Years



Daily Movements Urban - Forested (age classes)

- 63 fledglings from urban sites.
- 37 fledglings from forested sites.

Movement distance varied between forested (35.52m) and urban (24.09m) fledglings, indicating a significant effect per age class/area ($p=0.011$).

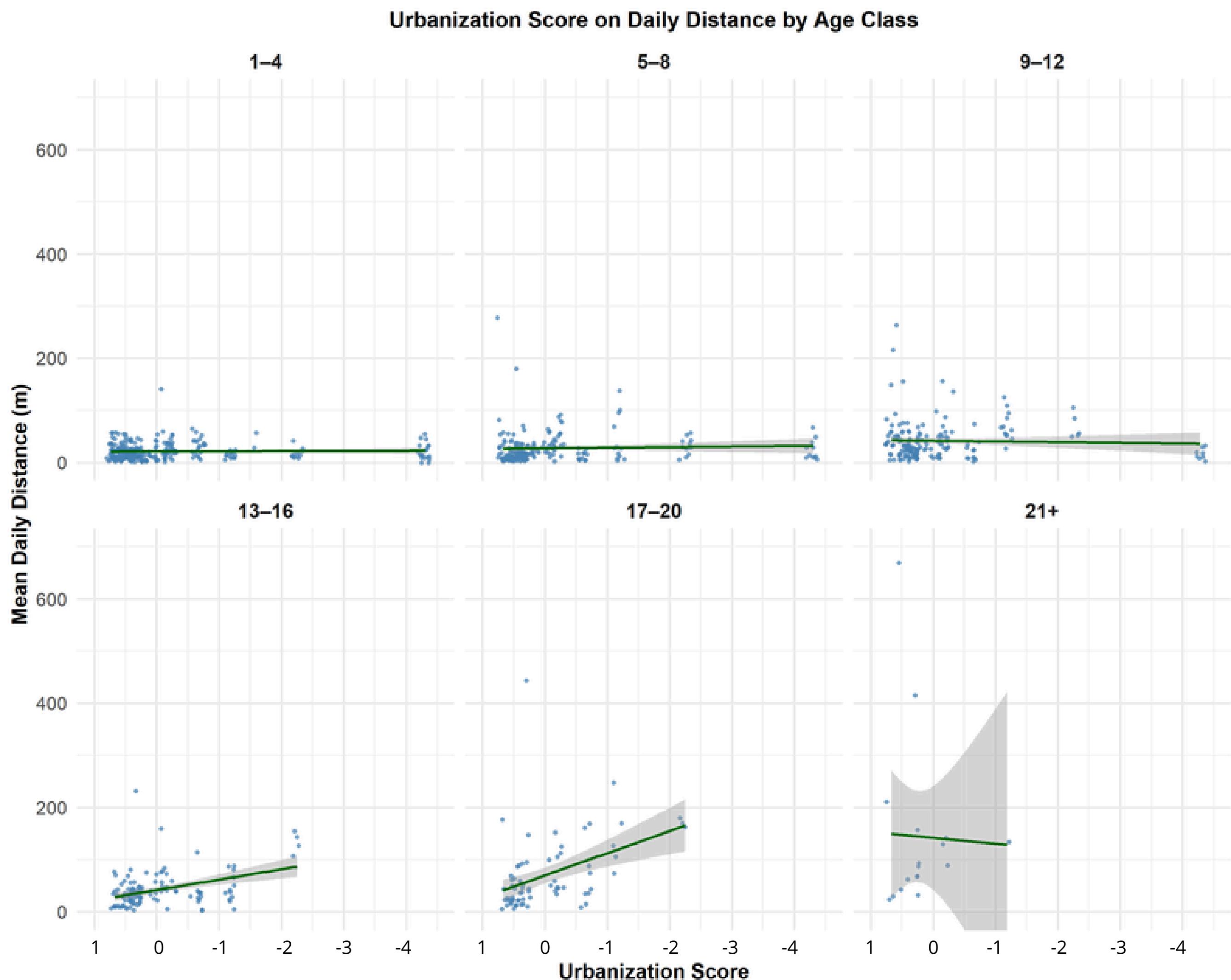
Urbanization Score on Daily Distance by Age Class

Urbanization on movement

- Urbanization score alone was not a significant predictor of movement ($p= 0.851$).
- Urbanization effect is age dependent.

13-16 ($p= <0.001^*$)

17-20 ($p(<0.001^*)$)



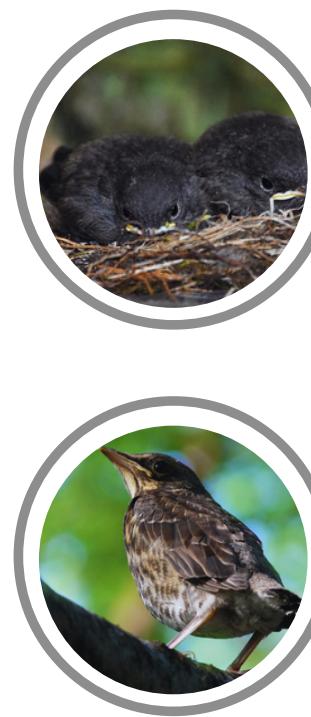
RESULTS



CLUTCH SIZE
 $p= 0.039^*$



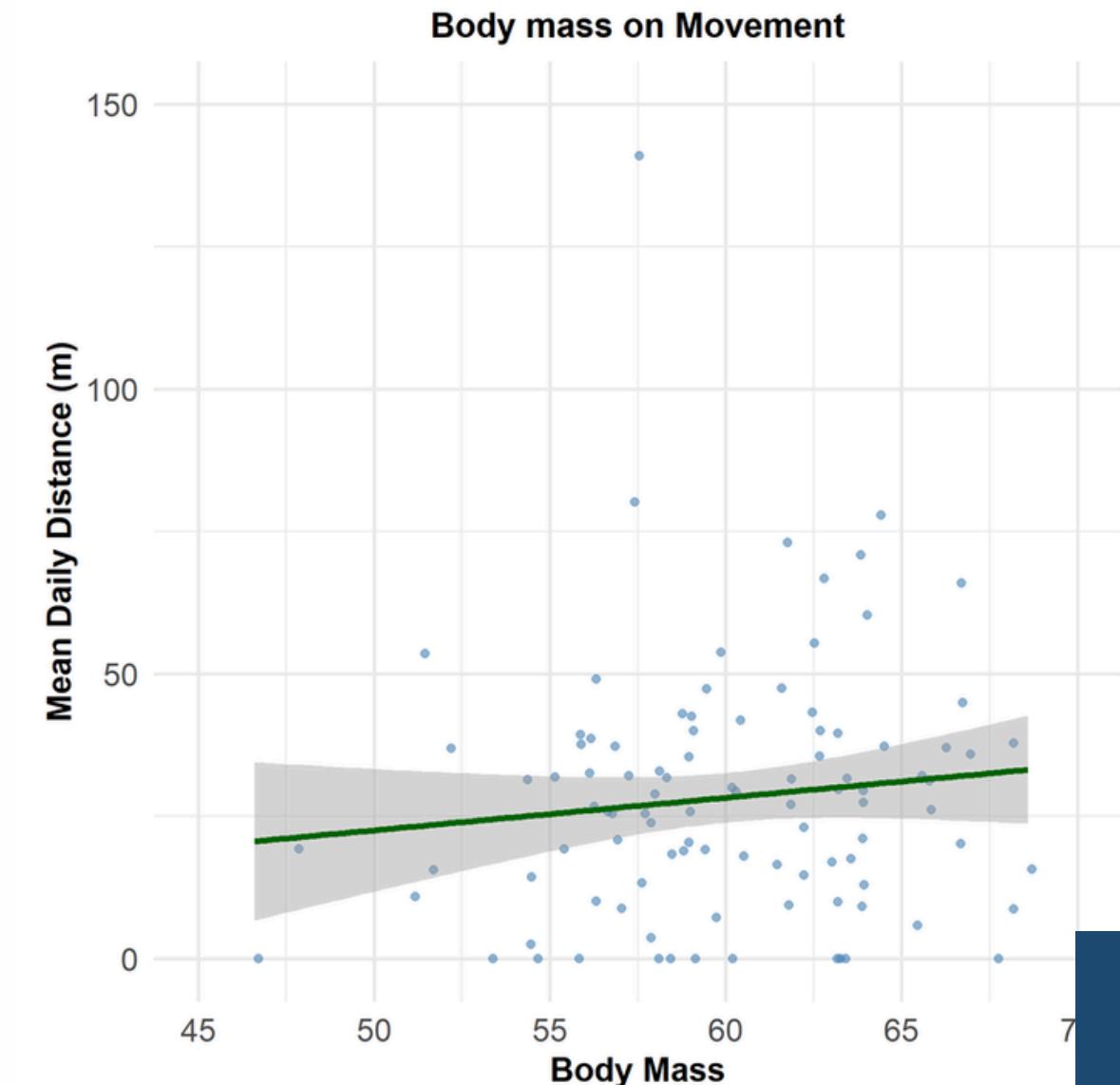
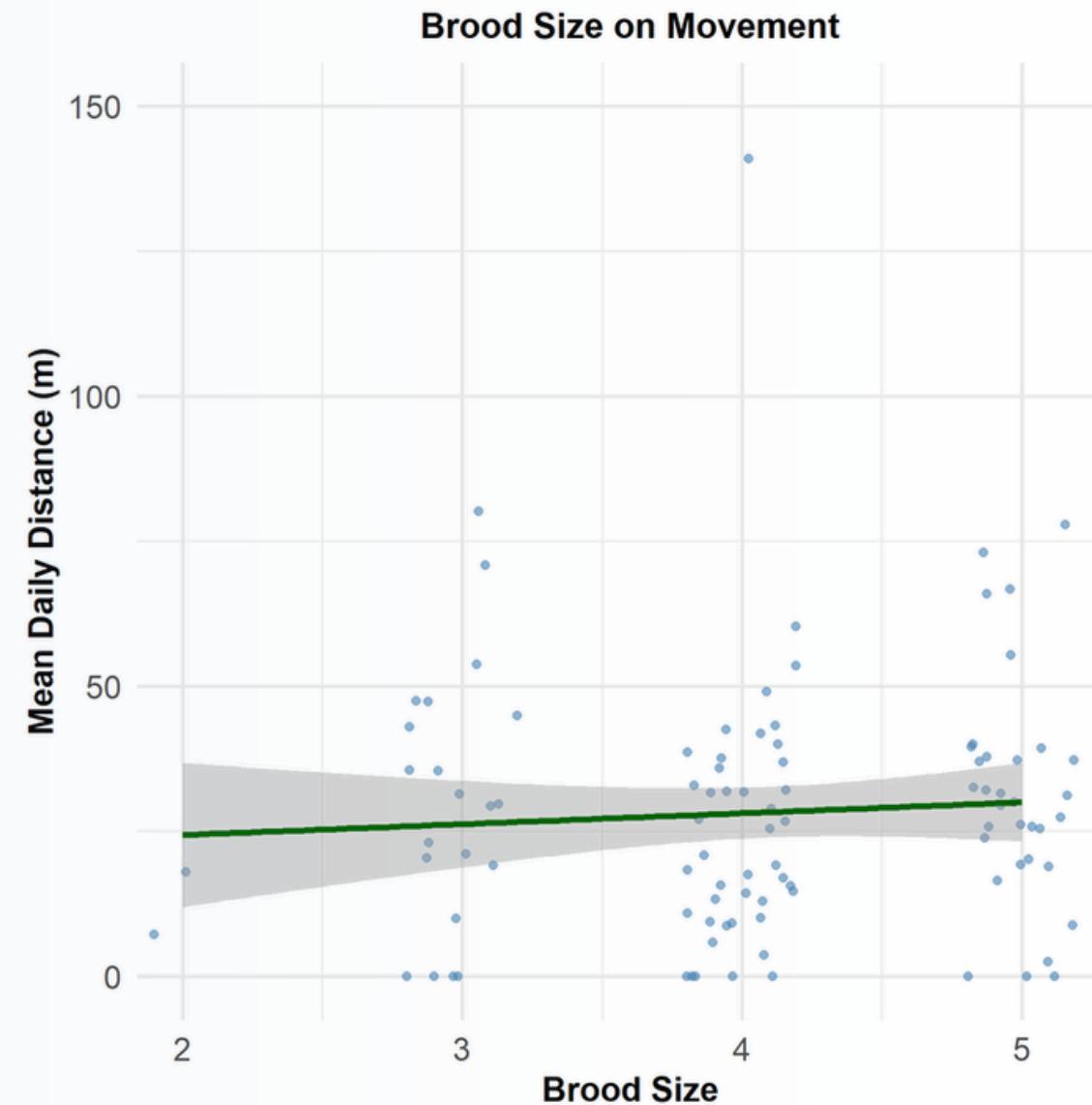
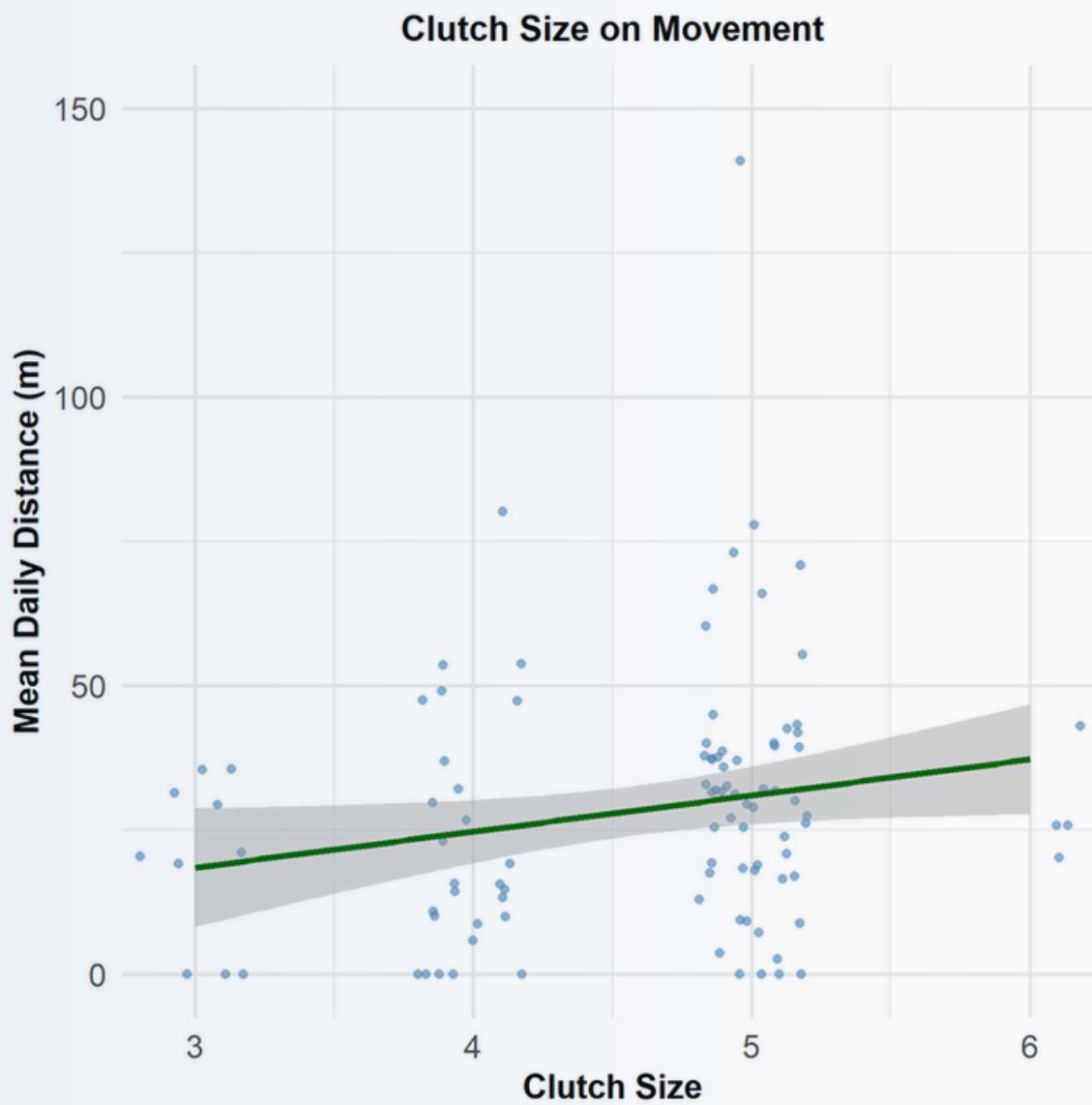
BROOD SIZE
 $p= 0.084$



SEX
 $p= 0.064$



BODY MASS
 $p=0.180$



RESULTS

Survival Estimates

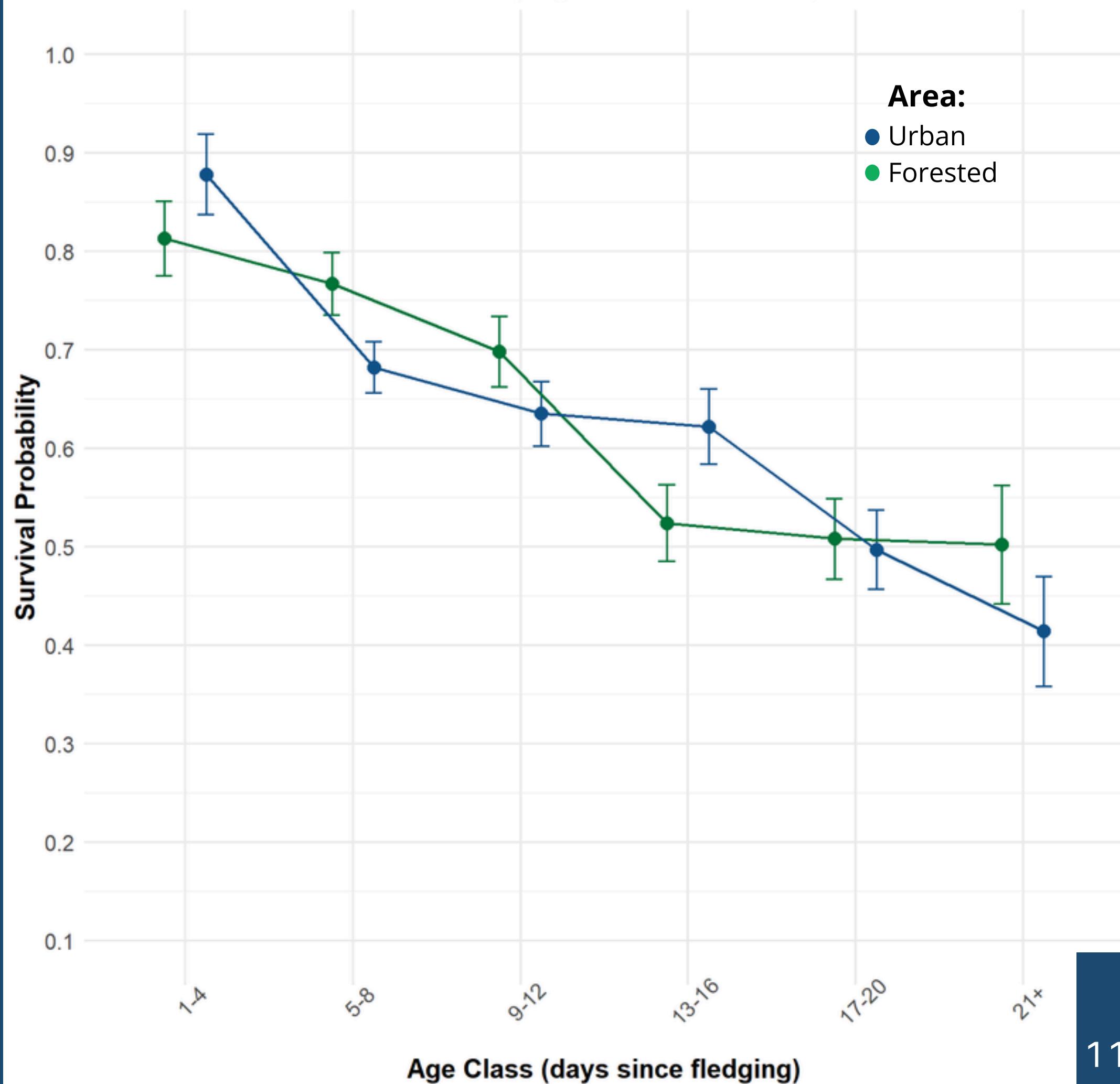
Over the 100 fledglings tracked, we documented mortality in **21** birds.

Best supported model: $\Phi(g.t)$, $p(g.t)$
 QAIC= 273.87.

The cumulative survival probability:

Urban= **0.622** (95% CI, 0.41-0.87).

Forested= **0.646** (95% CI, 0.50-0.81).





Movement differs by level of urbanization

Urban structure may restrict or reduce the need for movement.

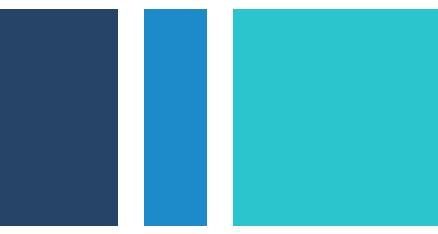
Survival not strictly determined by area

Context-dependent (year-specific conditions).

TAKE-HOME MESSAGE

Urbanization effects depend on age

Urbanization boosts movement in older fledglings—youngest remain constrained



THANK YOU!

