COVER & EDGE: LANDSCAPE FACTORS AFFECTING NEONATAL WHITE-TAILED DEER SURVIVAL ACROSS BEHAVIORAL PERIODS

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INTRODUCTION

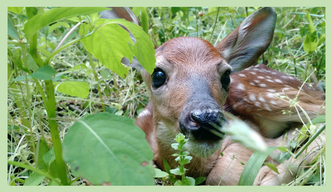
Exploring the temporal variance in white-tailed deer fawn survival across behavioral stages and landscape composition

Why White-tailed Deer?

- White-tailed deer are abundant, widespread, and the most harvested game species in the US[1, 2]
- Their ecological and social importance emphasizes the need to understand and manage these populations effectively
- Prior research on this species' offspring survival has resulted in conflicting findings in the primary cause of mortality, which influences broader population dynamics[3, 4]

Research Questions:

i. Do white-tailed deer neonatal behavioral stages affect their survival rates?
ii. How does edge structure and shape impact white-tailed deer neonatal survival?



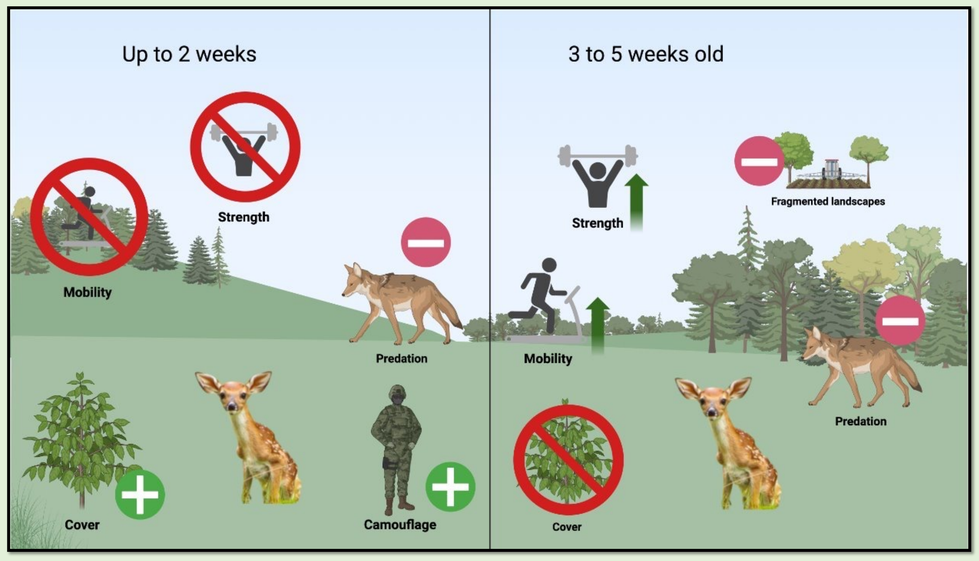
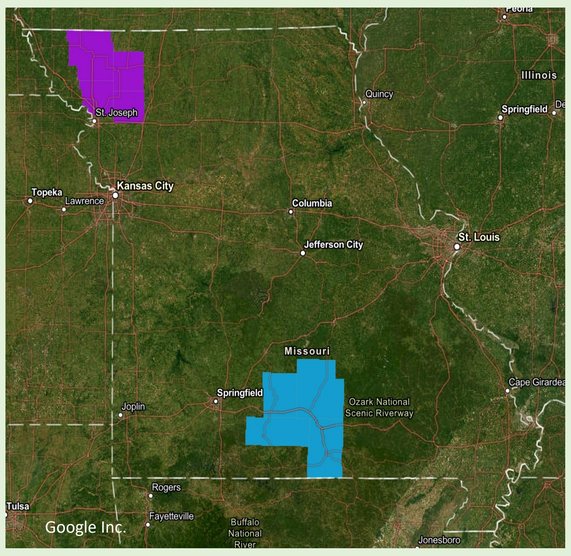


Figure 1: Research questions' explanations. Behavioral stage hypotheses' variable relationships in the first two weeks of a fawn's life and when fawns are three to five weeks old.



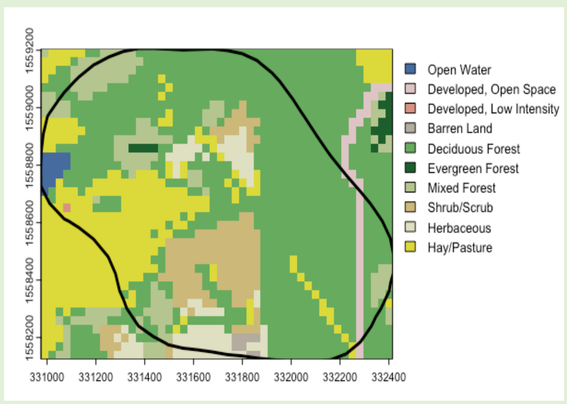


Figure 2: An adult female home range (black outline) overlayed on the National Landcover Database which depicts landcover types.

METHODS

Study System:

- Northwest Missouri is highly fragmented & dominated by agricultural fields. The primary predator species are bobcat and coyote
- Southcentral Missouri is a more contiguous forest-grassland landscape with topographical variation. The primary predator species are bobcat, coyote, and black bear

Data Collection:

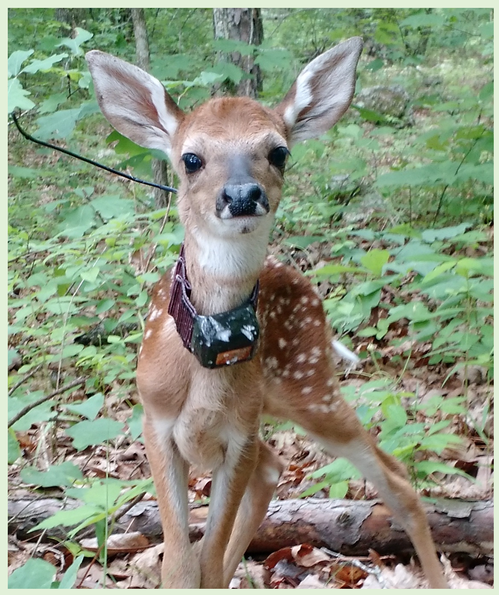
- In the winters of 2015-2019, over 1500 white-tailed deer were tracked using GPS collars
- Almost 400 fawns were tracked using high-frequency radio collars

Statistical Analysis:

- We clipped maternal weekly home ranges to a land use layer
- We calculated 3-week survival rates using a logistic regression
- We used the Kaplan-Meier method to estimate the survival probability
- We will quantify white-tailed deer fawn temporal variation in survival using a discrete-time survival model
- We will analyze this model in a Bayesian statistical framework using JAGS

$$cloglog(\lambda_{i,t}) = \beta_0 + \mathrm{E}_{k=1}^{K}\beta_k X_{i,t,k,}$$

Discrete-time survival model with weekly hazard rates[1]



PRELIMINARY RESULTS

- Female fawns have a higher survival probability than males
- Fawns in the southern site have a higher survival probability than those in the northern sites

	North	South
Male	52%	68%
Female	65.9%	79.5%

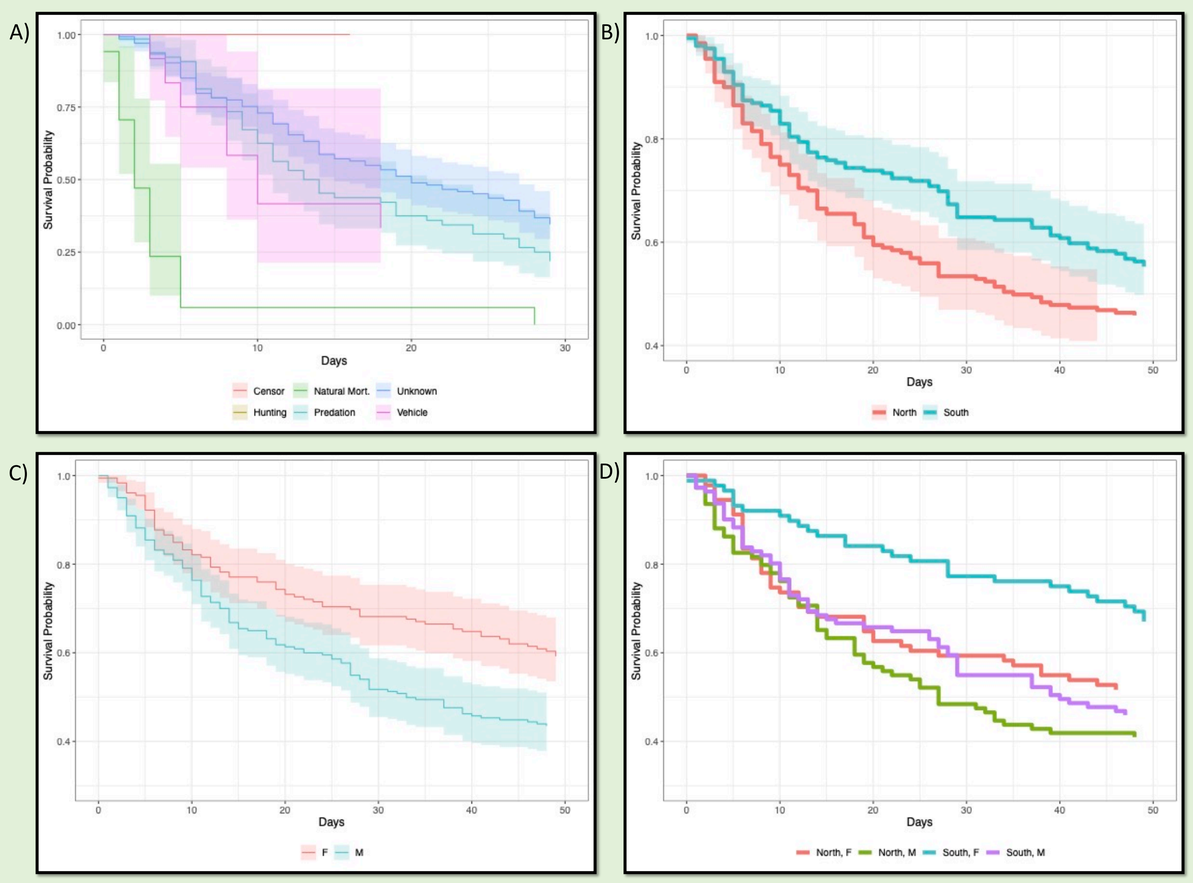


Figure 3: Preliminary survival plots of white-tailed deer fawns collected from 2015-2019 in two study sites in Missouri, USA. A) Survival probability across mortality causes within the first 30 days of fawn's lives. B) Survival probability between study sites within the first 50 days of a fawn's life. C) Survival probability between sexes within the first 50 days of a fawn's life. D) Survival Probability across study site and sex within the first 50 days of a fawn's life.

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