

Regrown Tails of Lizards in Urban Areas of Metro Phoenix

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Introduction and Objectives

- Lizards, when faced with predation, autotomize (drop) their tails to escape.
- The rates of this have been shown to vary in some cases in the range from urban to wildland, due to changes in predator populations (Tyler et al., 2016) (Balakrishna et al., 2021) (Forti et al., 2025).
- Lizards in urban areas may face additional stressors that alter their behavior (Sermersheim, 2024), and/or put them at risk of predation or reduce their ability to avoid predators (Winchell et al., 2019).
- I've studied lizard tail regrowth across neighborhoods in the metro Phoenix area, comparing the percentage of lizards with and without regrown tails amongst neighborhoods across an environmental and economic gradient.
- I predict that lizards in more urban "core" neighborhoods will have greater rates of tail autotomy, as the stressors and novel predators leave them more vulnerable to predation.

Methods

I've selected lizard images from 8 sample neighborhoods, most sampled from the CAP LTER (Central Arizona Phoenix Long Term Ecological Research) project, which for the last 28 years has studied the impact of various human factors on wildlife in the Phoenix area. In addition, since many sample neighborhoods provided insufficient data, I've studied three additional Phoenix area neighborhoods, evaluating their demographics with census data.

To determine lizard tail autotomy, I've used inaturalist.org's maps to locate lizards in the study neighborhoods, and evaluated the photos for signs of regrowth. I've selected up to 10 photos from each area.



Fig 1. Example of a lizard (*Cophosaurus texanus*) with an original tail.

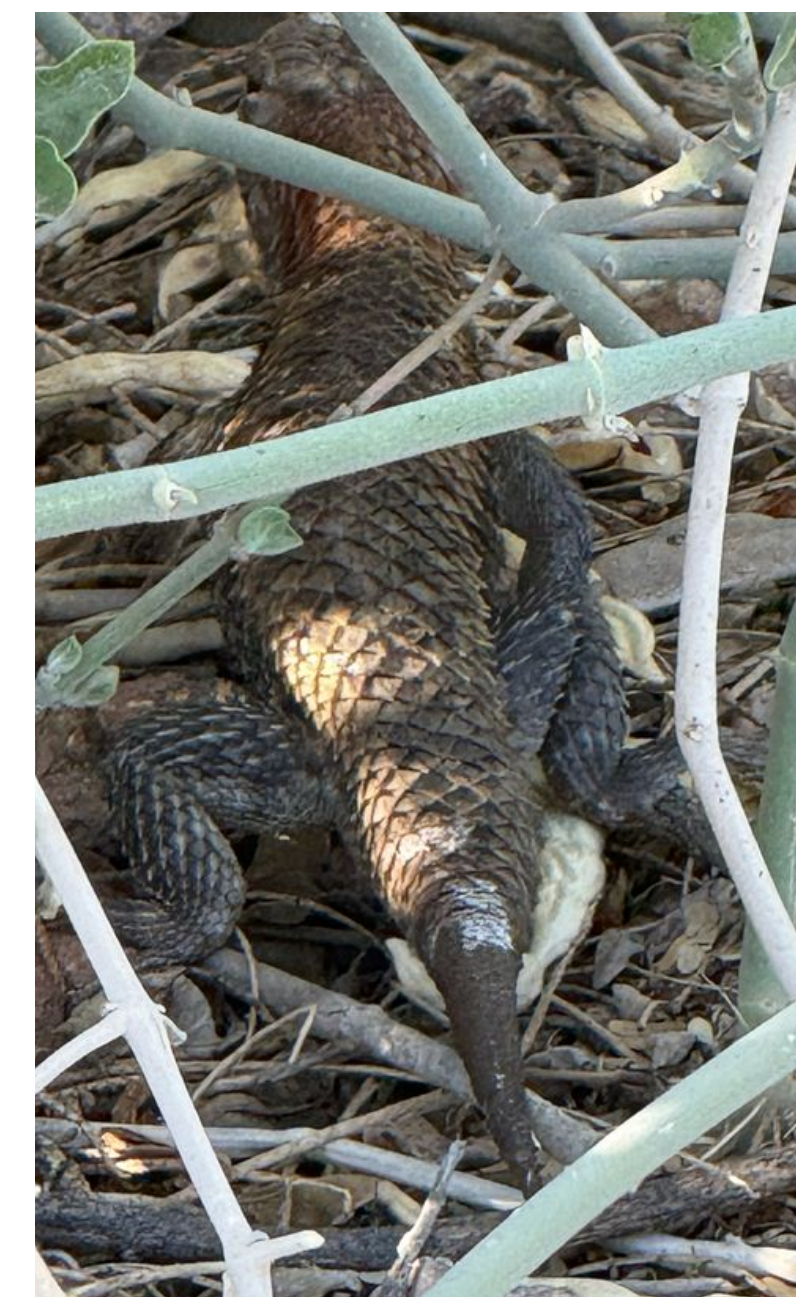
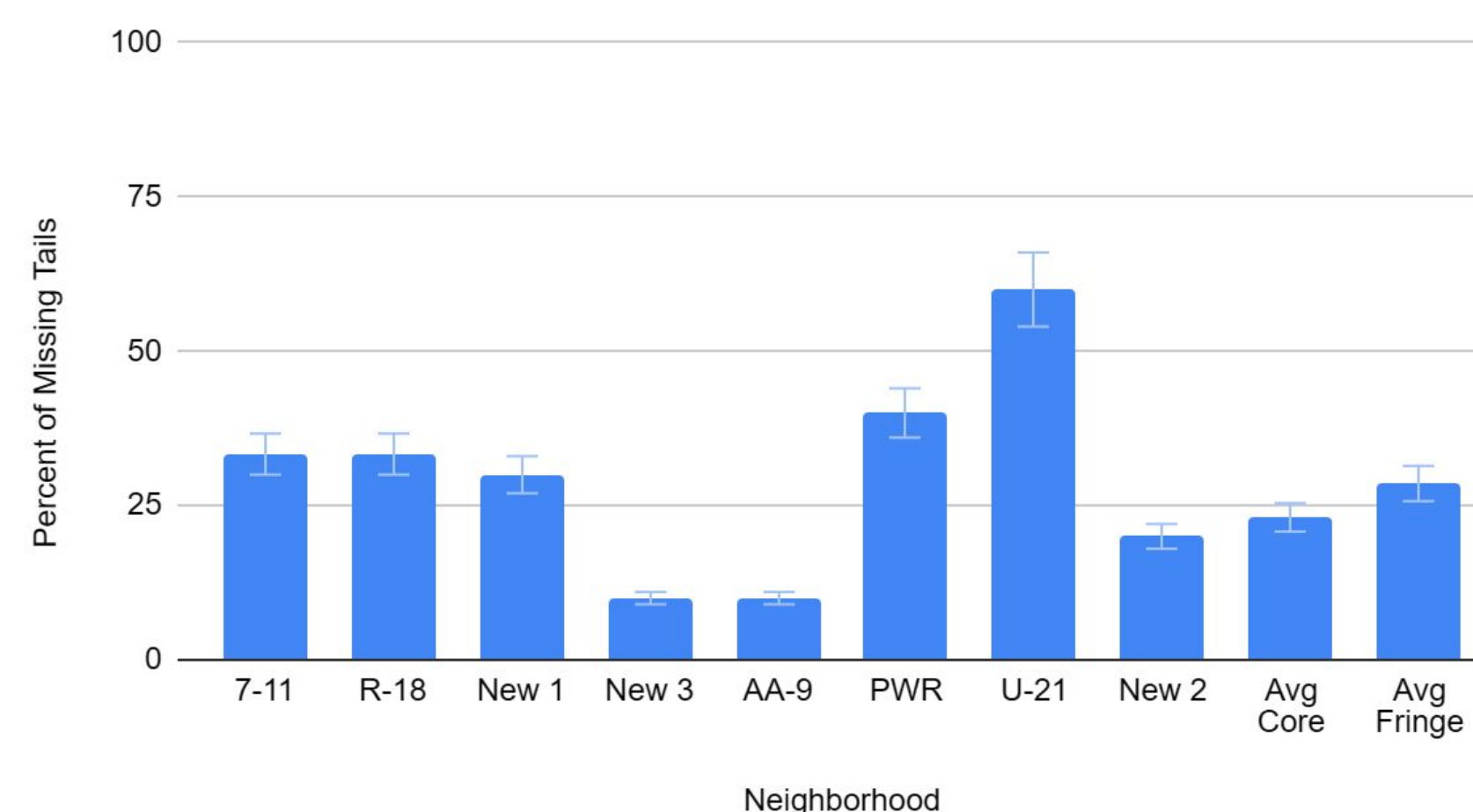


Fig 2. Example of a lizard (*Sceloporus magister*) with a regrown tail.

Results

In total, I evaluated 61 photos. In the 4 "core" neighborhoods (the more urbanized ones), which also were largely lower income, the average missing tail percentage was 23.1% (SE: 5.6%). In the "fringe" (less urbanized) neighborhoods, the average missing tail percentage was 28.6% (SE: 11.1%). The p-value was 0.661, indicating no significant difference.

Percent of Tails Missing Across Neighborhoods



Conclusions

- The number of autotomized tails didn't vary significantly between "core" and "fringe" neighborhoods.
- The "fringe" neighborhoods had more variation in the percentages of lizards with tail regeneration than the "core" neighborhoods, indicating that conditions in those neighborhoods may vary more than those in "core" neighborhoods.
- The number and effectiveness of predators in urban and rural areas may be roughly equivalent.
- Alternatively, there may be more predators in rural areas, but lizards in urban areas may have behaviors that endanger them more than those in rural areas.
- The small sample size of the study, as well as the biases of inaturalist users (for instance, higher income areas have more entries), may skew this data.

Literature Cited & Acknowledgements

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