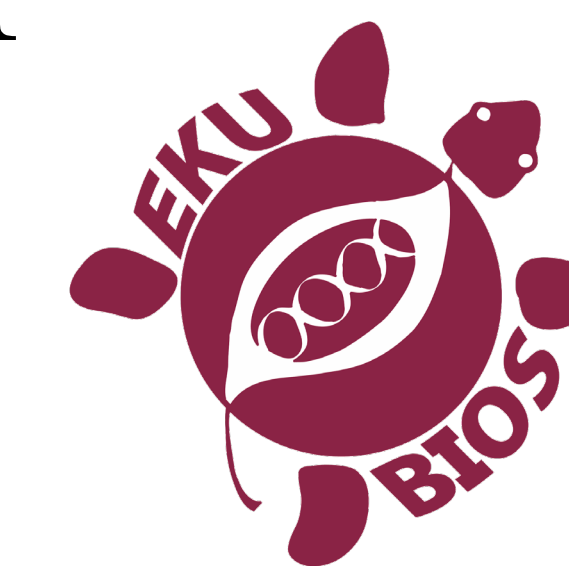




# Factors affecting foraging success of the Eastern Copperhead

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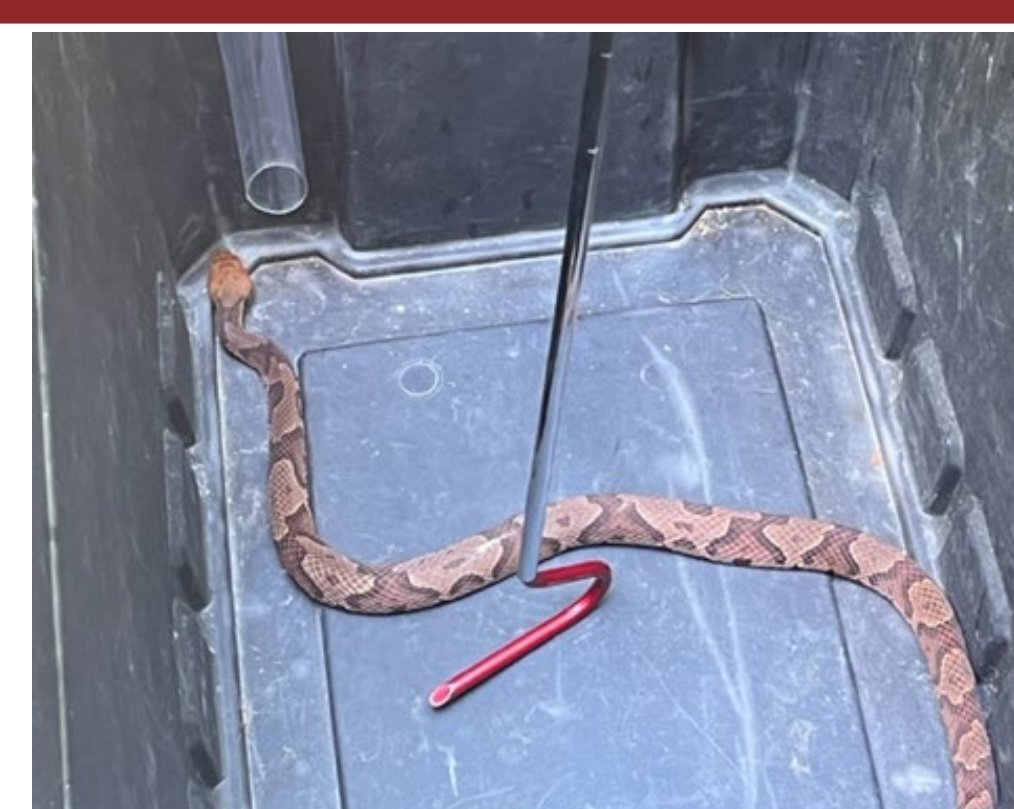


## Introduction

- The Eastern copperhead (*Agkistrodon contortrix*) is evolutionarily adapted to be wait-ambush predators on the forest floor that feed on small vertebrates such as mice and small birds.
- However, *A. contortrix* shift their foraging behavior to actively hunting annual cicadas emerging on trees during the summer months.
- We aim to understand how different factors can attest their foraging success measured by number of cicadas it consumes.

## Methods

- Sample at Koomer Ridge Campground
- Nightly sampling using circular transects
- Record number of cicadas and snakes seen per night
- Scan snakes for ID (PIT tags)
- Capture snakes for measurements



## Results

- Positive, significant relationship between number of cicadas eaten by individual snakes and number of active cicadas each year (Fig 1) ( $t = 3.741$ ,  $df = 41$ ,  $P = 0.001$ ).
- Positive, although non-significant, relationship between total number of cicadas eaten each year and the number of active cicadas (Fig 2) ( $t = 2.947$ ,  $df = 3$ ,  $P = 0.098$ ).
- Medium-sized snakes tended to consume more cicadas than both smaller and larger snakes (Fig 3).
- Positive, significant relationship between number of nights copperheads visited the campground and number of cicadas eaten (Fig 4) ( $t = 6.782$ ,  $df = 40$ ,  $P < 0.001$ ).

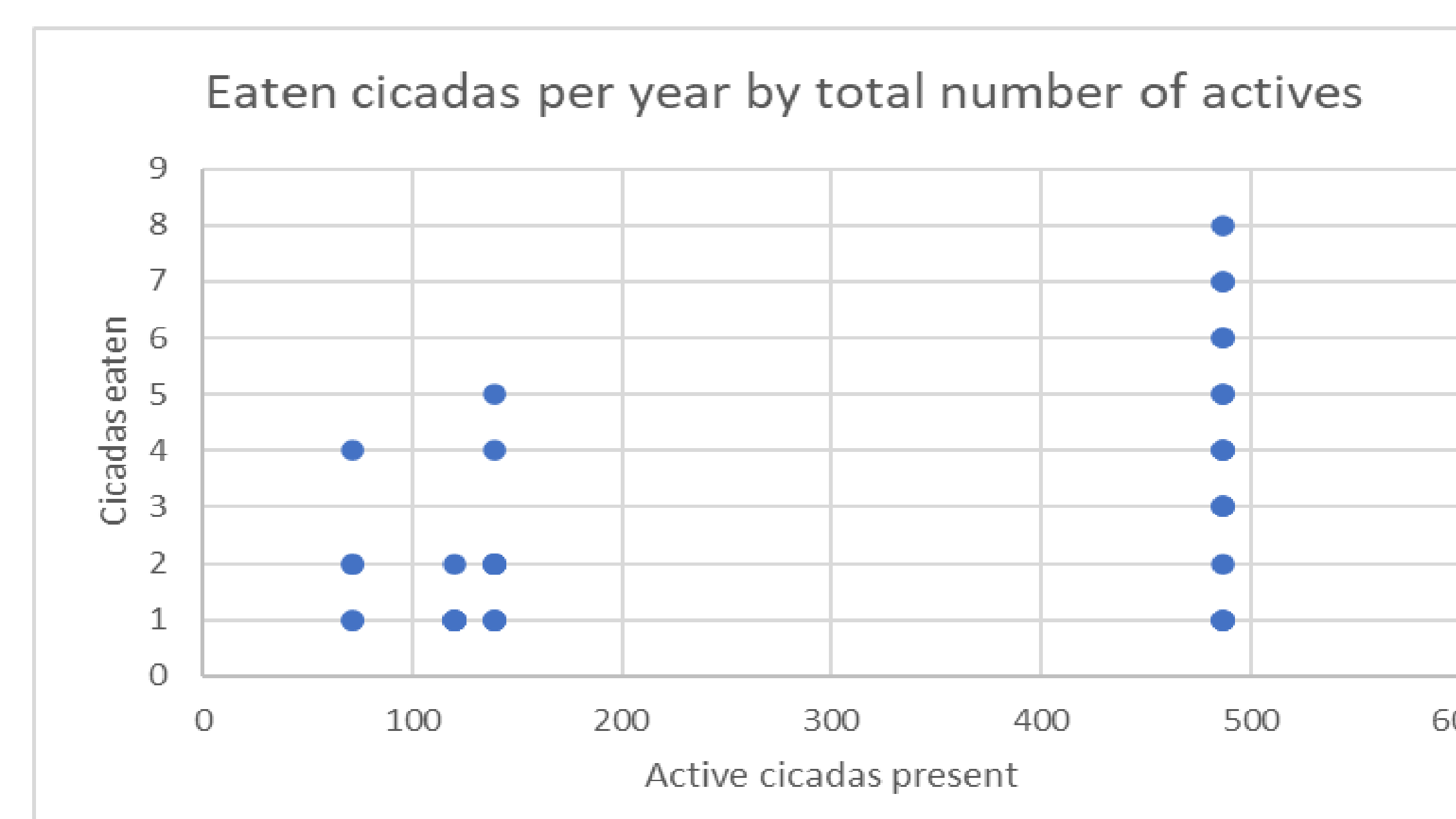


Figure 1: Number of cicadas eaten per snake compared to how many possible cicadas there were that year at Koomer Ridge Campground between 2019-2022.

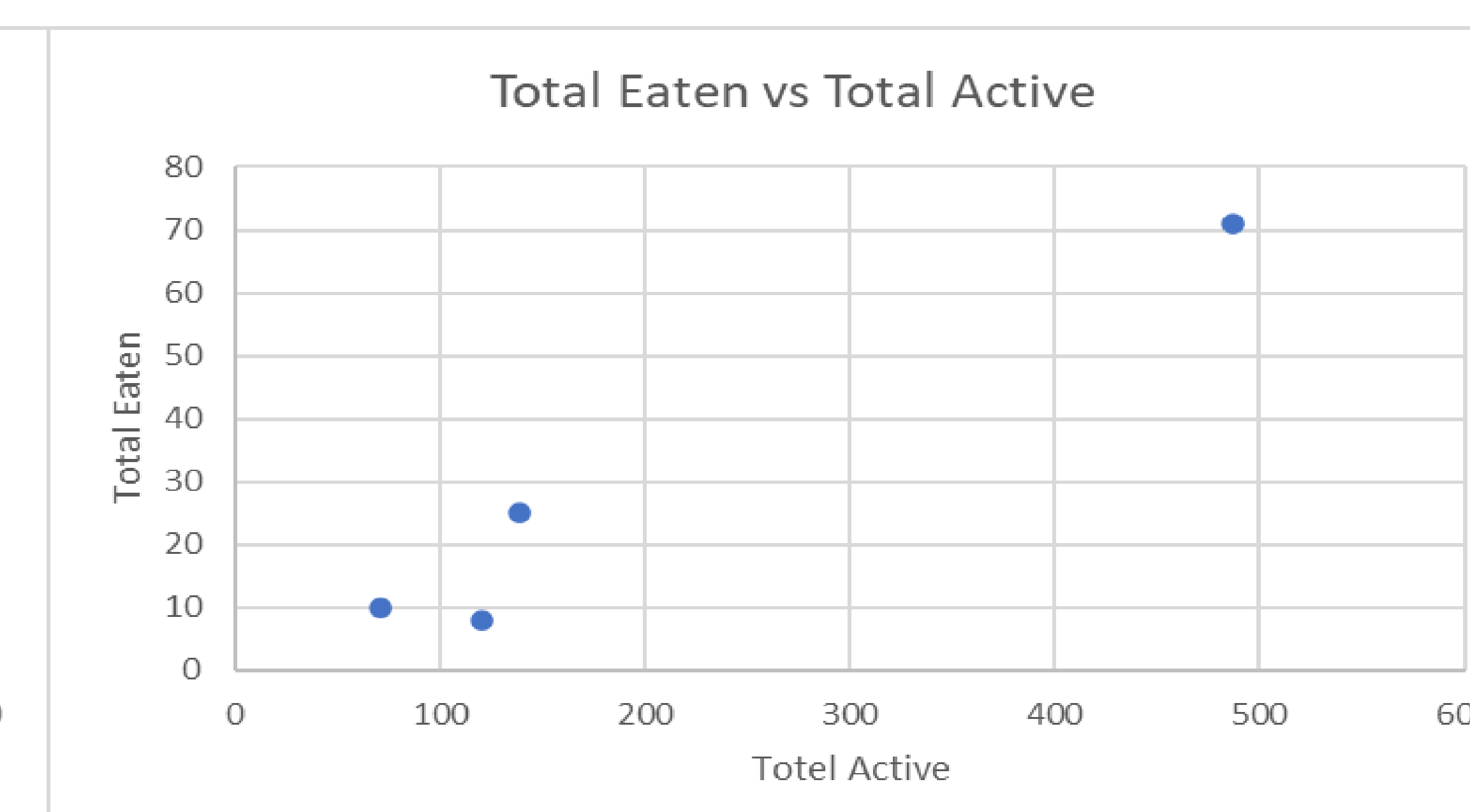


Figure 2: Total number of cicadas eaten compared to how many possible cicadas there were that year at Koomer Ridge Campground between 2019-2022.

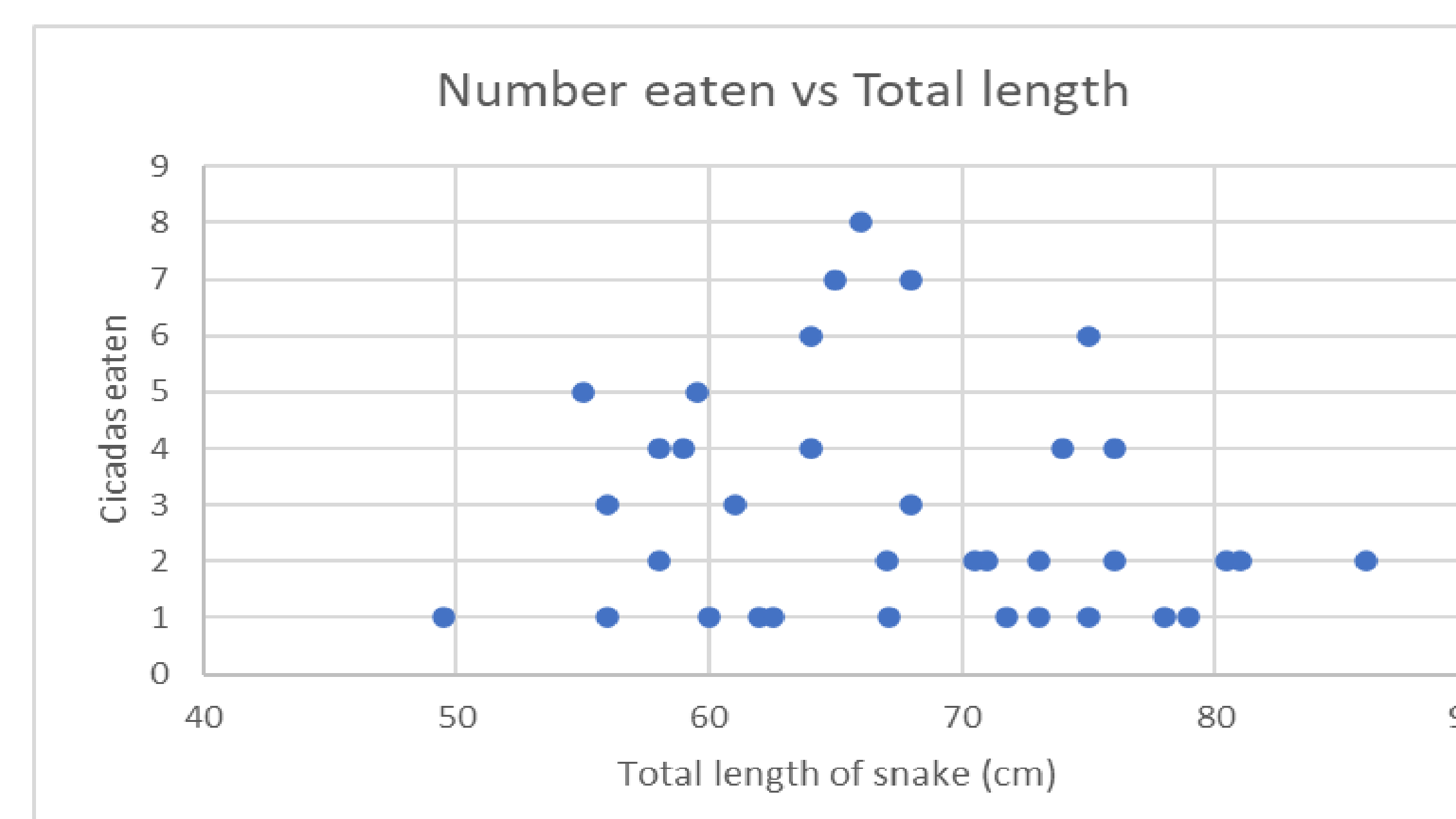


Figure 3: Number of cicadas eaten compared to total length of the snake at Koomer Ridge Campground between 2019-2022.

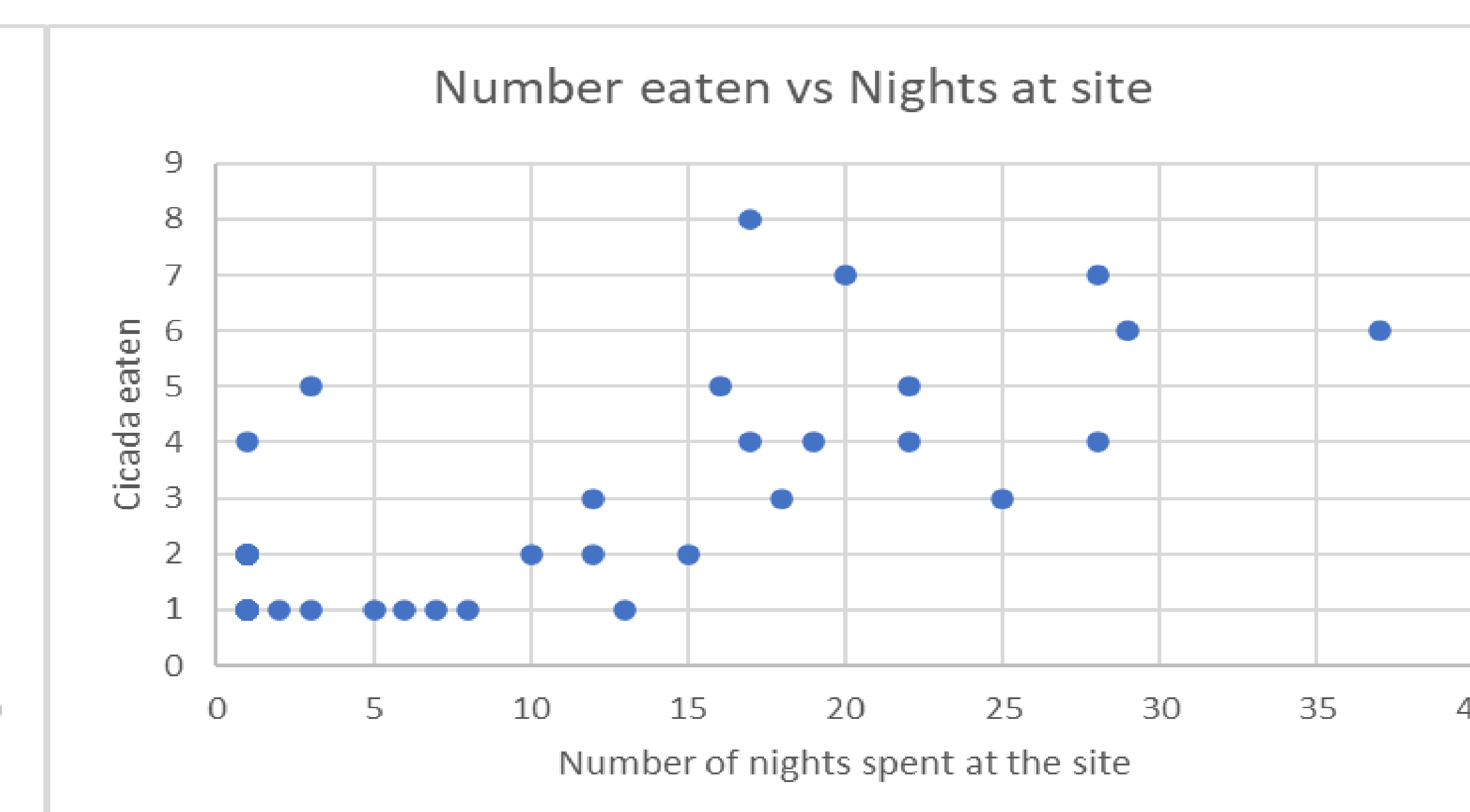


Figure 4: Number of cicadas eaten per snake compared to how many nights the snake was observed at Koomer Ridge Campground between 2019-2022.

## Conclusions

- Prior to these analyses, we were unsure how foraging success related to frequency. Interestingly, there appears to be a benefit of increased foraging success.
- As expected, copperheads consume more cicadas when there are more cicadas present.
- Potential limitations:
  - Each year contained a decreasing number of cicada emergence since 2019.
  - Data from 2022 were limited because of the REU program schedule.
  - Previous years might have underestimated foraging success because this is the first year we focused on it.
- Further research should be done to explain why we observed less cicada emergence in 2022 and how location of emergence affects cicada survival.

## Acknowledgements

- We would like to thank the United States Forest Service for support and for access to Koomer Ridge Campground.
- Thanks to the REU 2022 program along with Dr. Brown and Dr. Watson for organizing it.
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