

Analysis of Foraging Bat Species on the SUNY Geneseo Campus

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Introduction

- Bats are found throughout North America and provide many important ecosystem services including pest control, pollination, and nutrient cycling (NABat, 2015)
- Bats are tough to study due to their nocturnal behavior, small size, and quick movements
- Bats utilize echolocation to navigate and find food at night
- Therefore, recording their foraging calls at night can provide a measure of the abundance and diversity of bat species in the area
- A previous survey of bats at SUNY Geneseo highlighted the big brown (*Eptesicus fuscus*), the silver-haired bat (*Lasionycteris noctivagans*), and the hoary bat (*Lasiurus cinereus*) as the most common bats on the SUNY Geneseo campus (Loce & Mann, 2018)
- The goal of this survey was to highlight the times and environmental conditions of peak bat activity from early June to late September

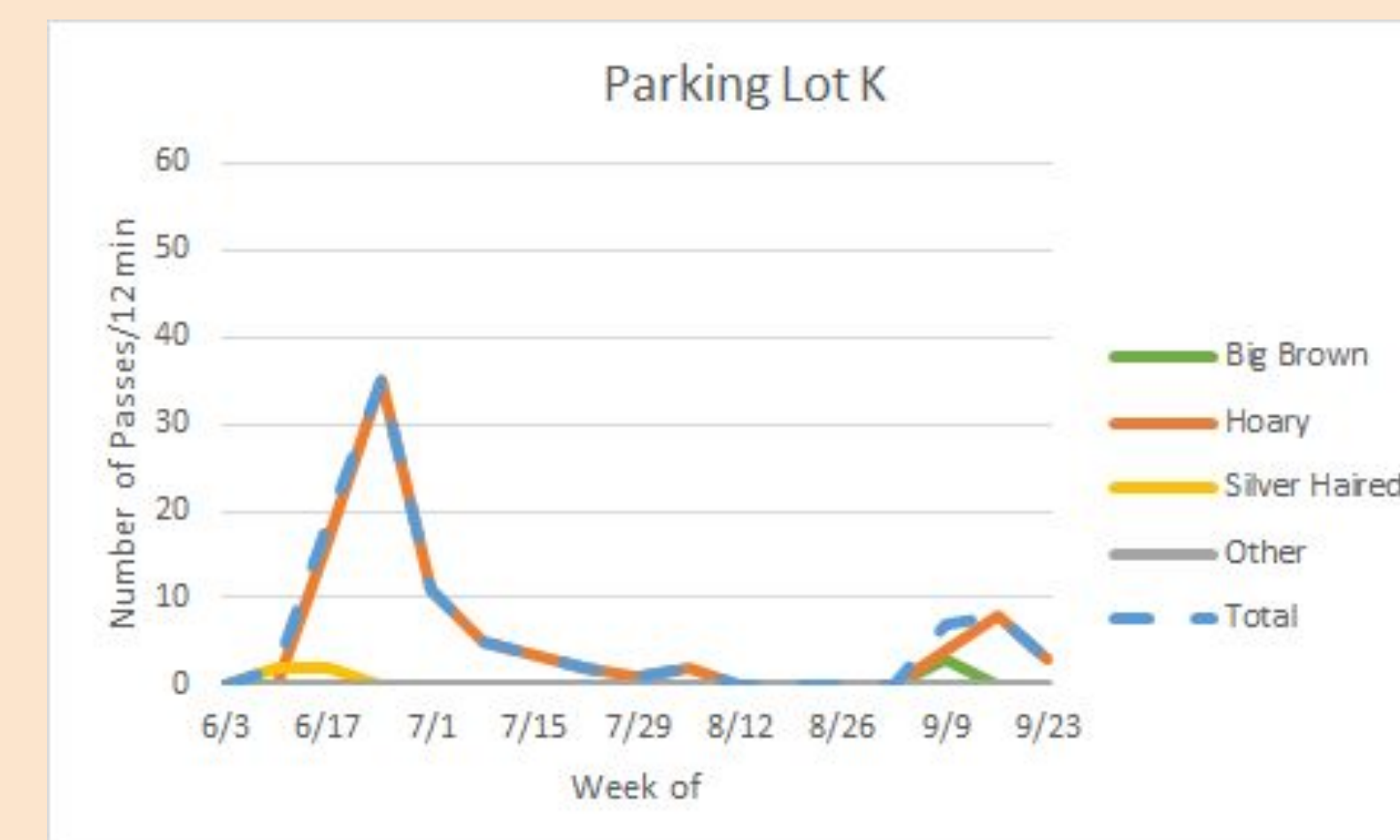
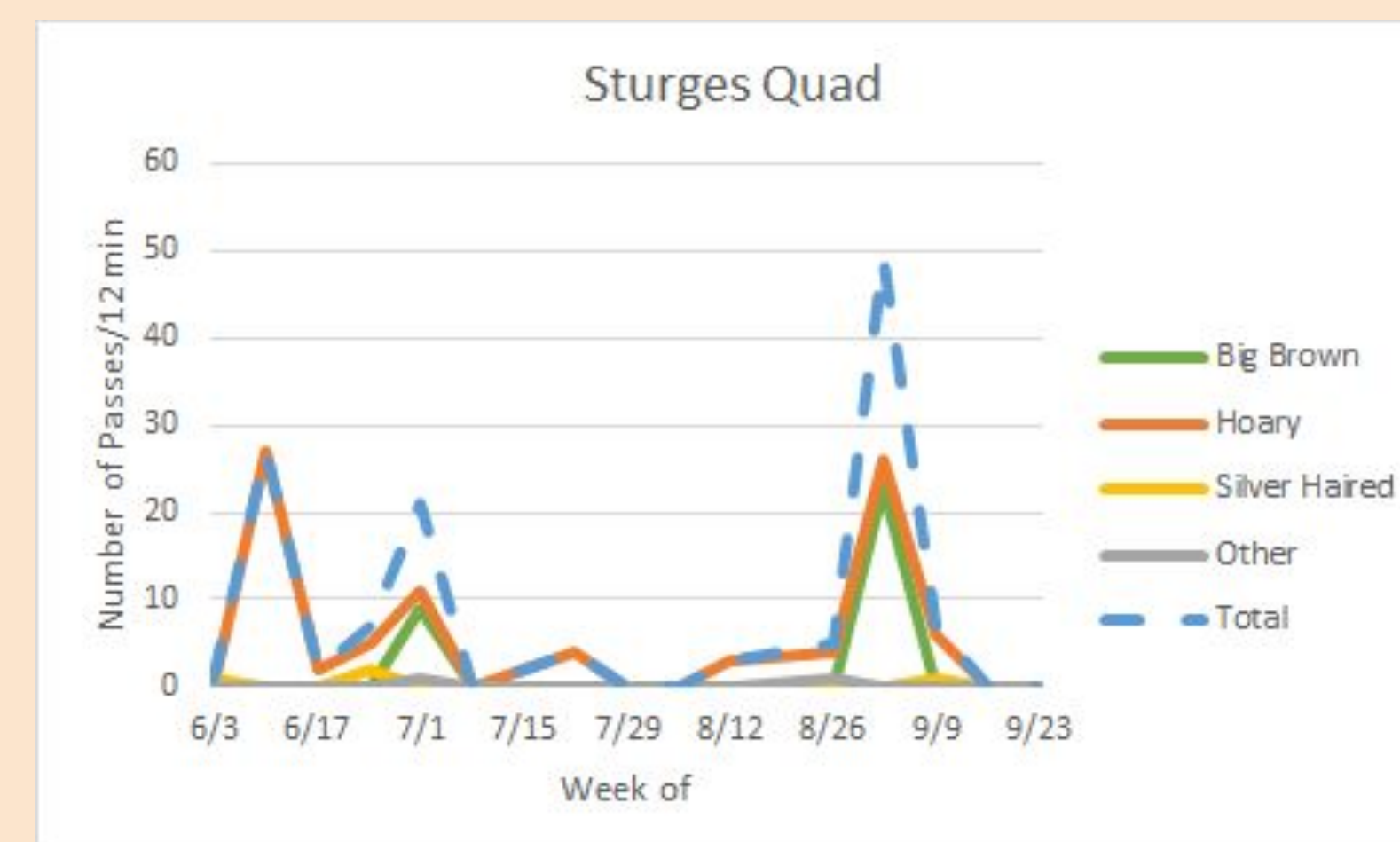
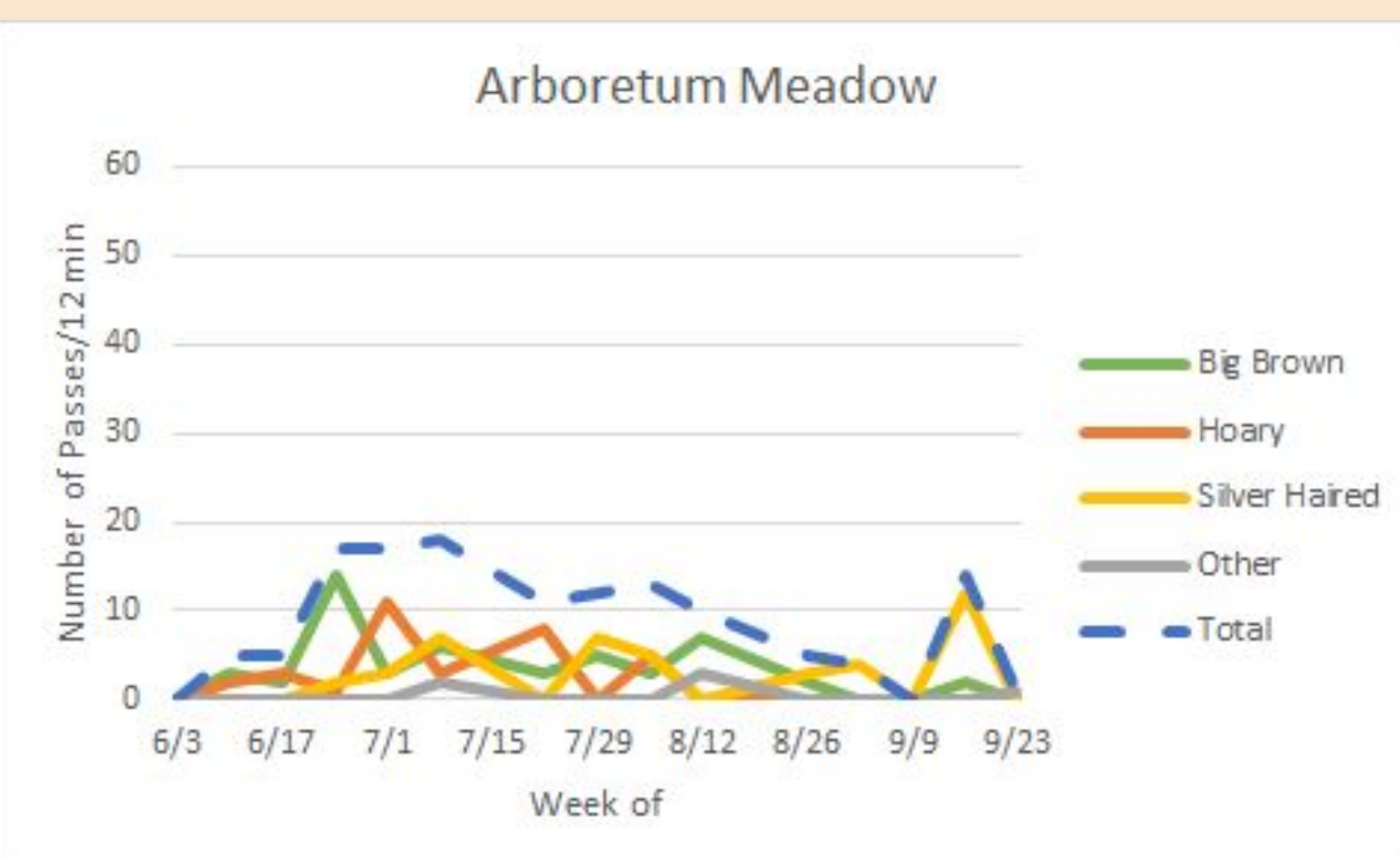
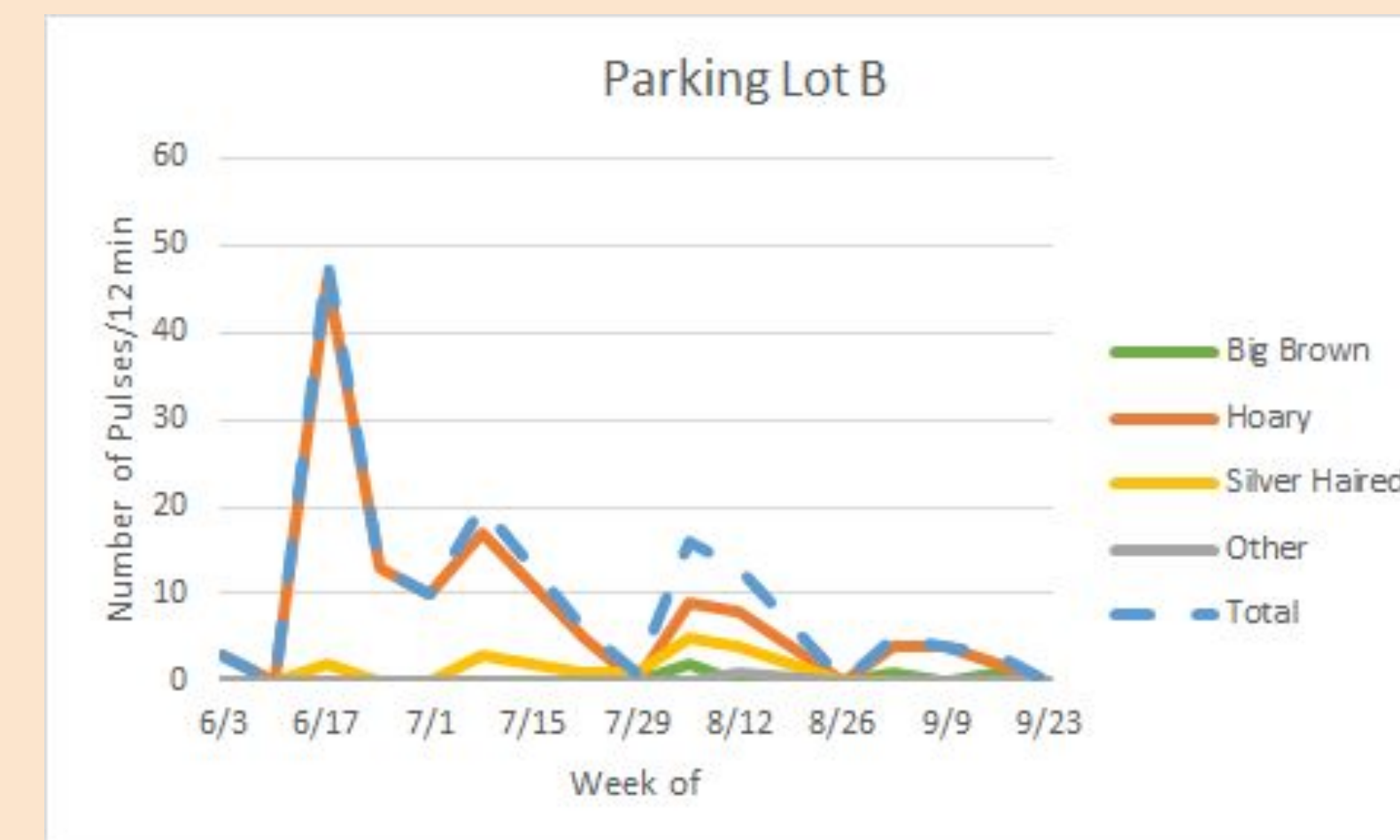
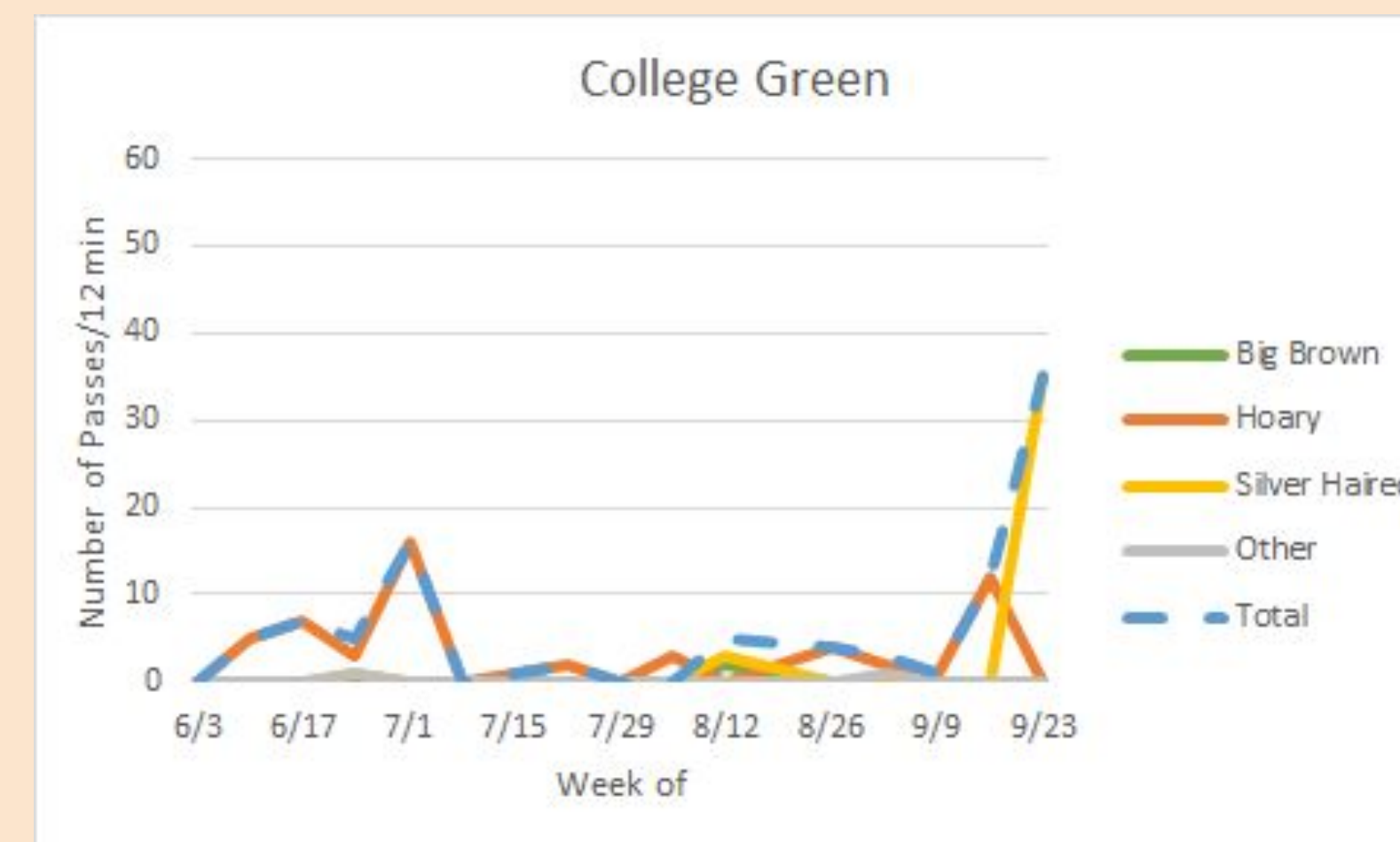
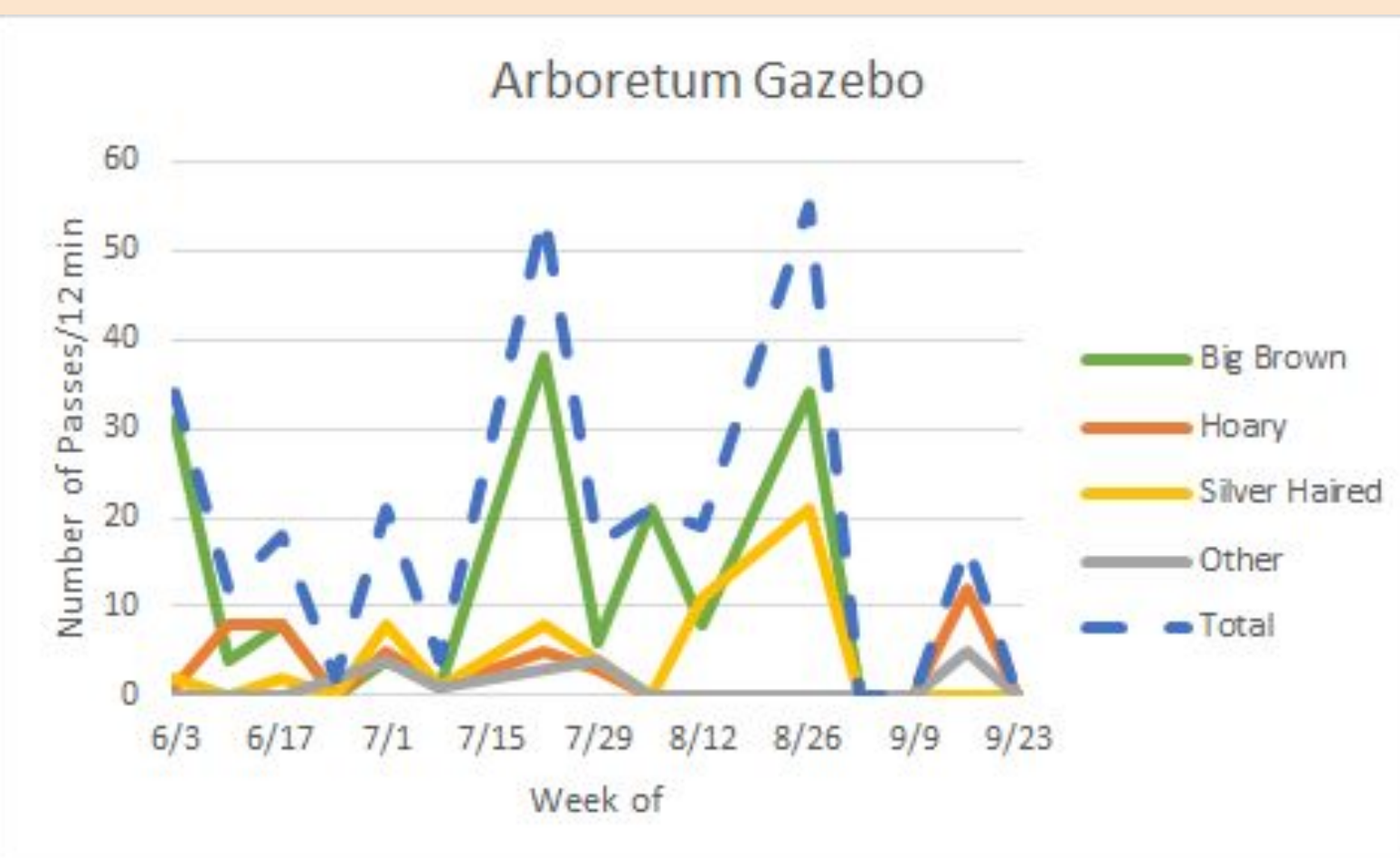
Methods

- Recordings were taken twice each week from June through September 2019 using the Echo Meter App and a specialized microphone to record high frequencies
 - The recordings were taken in six locations: Roemer Arboretum gazebo, Roemer Arboretum meadow, Sturges Quad, the College Green, Parking Lot B, and Parking Lot K
 - Each recording lasted 12 minutes and three were taken each night, followed by recordings at the other three locations another night during the same week
 - Temperature and humidity data were retrieved from the weather recording station at the ISC
- In total, 90 recordings were taken, 15 at each site
 - Passes were defined as pulses clearly visible in sequence from a single bat
- Each location was mapped via ArcGIS in order to determine the approximate amount of tree coverage

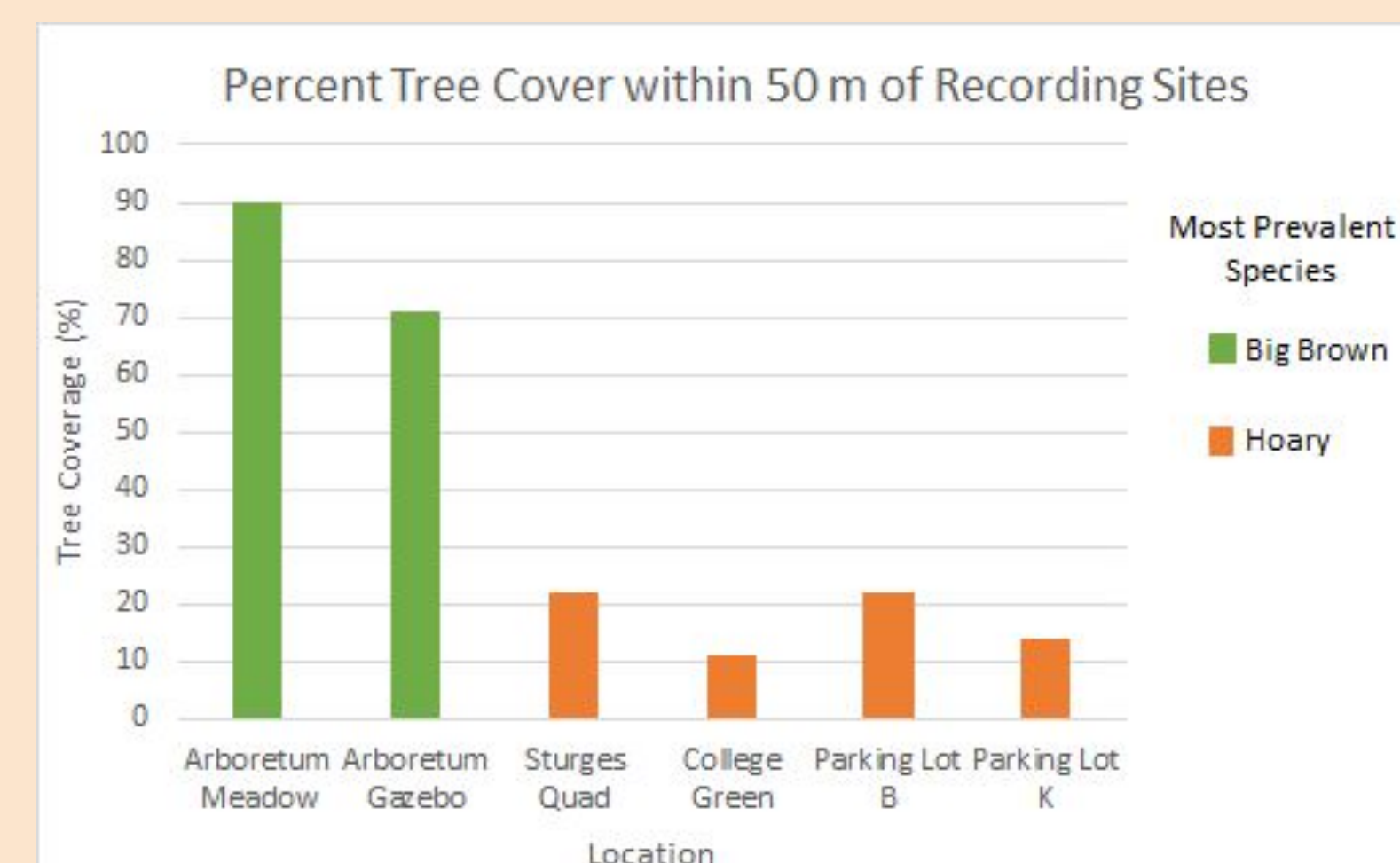


Figure 1: A map of the recording locations

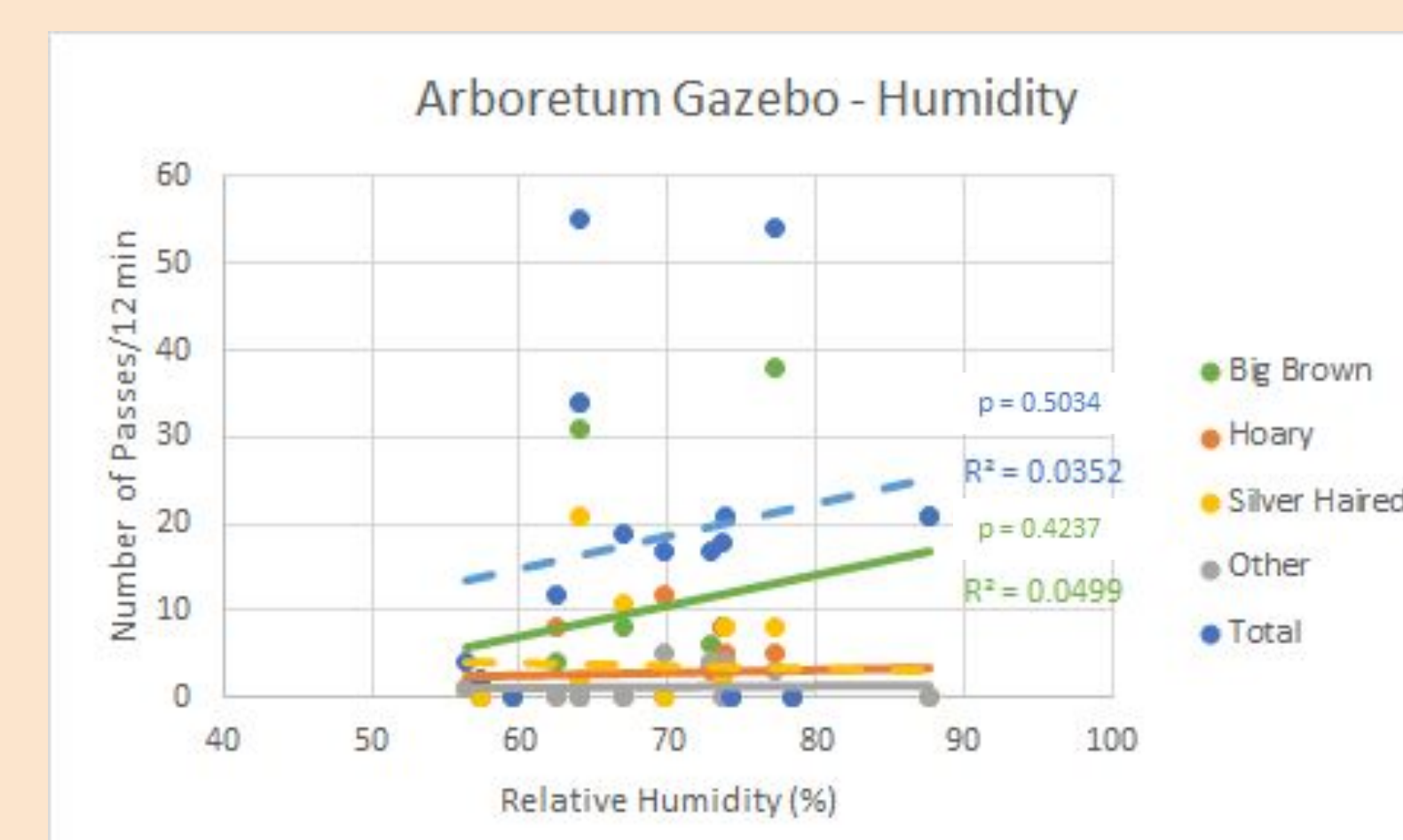
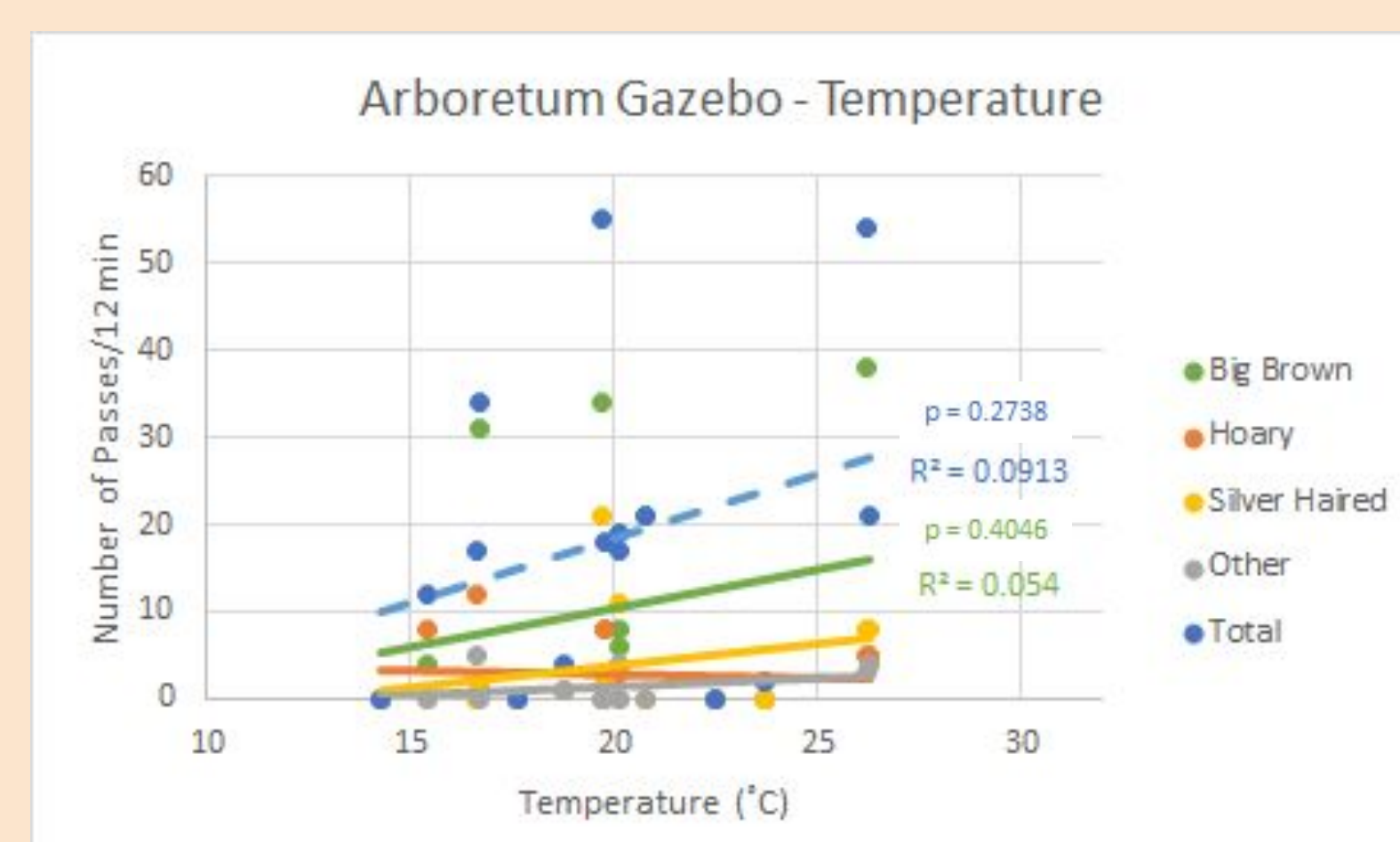
Foraging activity appears to most strongly depend on time of the season and location, with Big Brown activity peaking in late summer, and Hoary activity generally showing both an early and late summer peak.



The most prevalent species varies from site-to-site and is associated with the amount of tree coverage



Any correlation between foraging activity and temperature or humidity was insignificant



Discussion

- Hoary bats, which were most prevalent in parking lots, Sturges Quad, and the College Green, tend to prefer hunting in open areas (Gonzales et al., 2020)
- Hoary bats also prefer moths, which tend to congregate around lights, over other food sources, which could explain the prevalence of the species in the parking lots (Valdez & Cryan, 2009)
- Big brown bats prefer to both roost and forage in thinned-out forested areas, which could explain why they seem to be much more prevalent in the Arboretum (Perry & Thill, 2008)

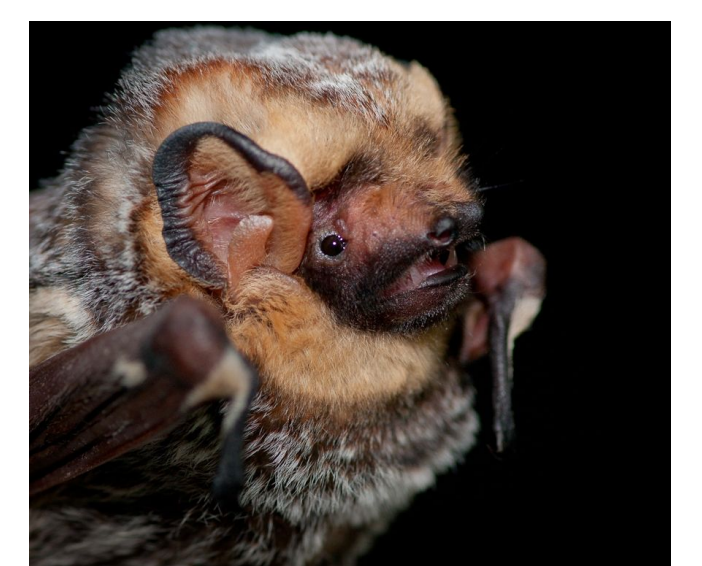
Future Studies

- If granted permission, bat boxes should be placed in the recording locations in order to determine if they help increase bat foraging call abundance



Big Brown Bat (*Eptesicus fuscus*)

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Hoary Bat (*Lasiurus cinereus*)

Daniel Neal [CC BY 2.0 (<https://creativecommons.org/licenses/by/2.0/>)]



Silver-haired Bat (*Lasionycteris noctivagans*)

Larisa Bishop-Boros [CC BY-SA 3.0 (<https://creativecommons.org/licenses/by-sa/3.0/>)]

Acknowledgements

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