

A Short Study of Odonata

Odonata Behavior and Ecology in the Neotropics

Ke Tasber

Insect Attraction to Color

Canopy, Understory and Ground Level of the Belizean Rainforest

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Introduction

The objective of this study was to ascertain the behaviors and habitat choices of dragonflies and damselflies in a neotropical environment. My hypothesis regarding this objective was two-fold. The first part of the of the hypothesis is that *Odonata* are active in places with certain specification, such as open space, a nearby water source, and access to sunlight. The second hypothesis was that, when in these habitats, dragonflies and damselflies would spend more time eating than any other activity.

Methods

In order to observe *Odonata* properly, it is important to find a suitable habitat for them to do all essential activities. I used map of the BFREE to identify water sources to study. I spent a minimum of 6 hours at each place, with one session in the morning and one session in the afternoon. During this time, I caught individuals for ID and comparison, and completed multiple focal animal samples of behavior over time.



Results & Discussion

Through the time I spent looking for habitats and studying the *Odonata* individuals, I was able to learn a good deal about the biodiversity of dragonflies in the Stann Creek district of Belize. An ideal habitat for these beautiful creatures does indeed include water and lots of sun but does NOT include open space. In comparing the Bladen River to the creek in the second photo above, the river only really supported one species of dragonfly and one species of damselfly. The creek had a wide range of biodiversity, with over 10 separate species of damselflies by themselves. I was also able to observe 6 different species of dragonfly up close. Therefore, my first hypothesis was refuted. The second hypothesis, that *Odonata* spends more time eating than other activities was also refuted according to the focal sample analysis I performed. The data indicated that, in this habitat, *Odonata* spent about 50% of their time interacting with each other and coasting.

Overall, this study was very incomplete. The time I spent in the field was overwhelmed with looking for where the *Odonata* spent their time; little was successful, and the conclusions I have made are based off two collections of data. In attempting to identify species on return to the US, I found that little research has been done on the diversity of *Odonata* in the Neotropics. For some of the individuals I captured, it was easy to identify what type they were, but with the rate of new species identified in these areas, it is impossible to know the exact species without more research.



Introduction

The objective of this study was to see if insects are attracted to specific colors at the canopy, understory and ground levels of the rainforest by using the BFREE observation tower. We used 5 different colored bowls (blue, green, red, yellow and purple) as the objects for color. We hypothesized that most insects would be attracted to the green bowl due to the leaves and green vegetation in the surrounding landscape. We also hypothesized that insects would be less attracted to the blue bowl due to the lack of the color in the surrounding landscape.

Methods

In order to measure insect attraction to color at canopy, understory, and ground level, the 35.17-meter observation tower at BREE was chosen as a location site for the experiment. The top of the tower would be used to measure attraction at the canopy, the middle of the tower would measure attraction at the understory, and the base of the tower was used to measure attraction at the ground level. Five bowls were obtained of the following colors: red, green, blue, yellow, and purple. Each bowl was filled with a mixture of water and peppermint scented Dr. Bronner's Pure-Castile Liquid soap. The color bowls were placed at each location for a total of 8 hours, afterwards the insects found within the bowls were sorted and identified by order.



Results & Discussion

Each insect found within its designated color was analyzed and sorted by order. For the canopy level, the color bowl with the most prominent amount of insects was yellow with three insects, and the least prominent amount had been red with no insects (Figure 1). Within the insects found at canopy level, a total of four were found to be Diptera, one was classified as Coleoptera, and three were classified as Hymenoptera (Figure 2). Though we were unable to include all our graphs, our hypotheses were supported by our data collection with most insects being drawn to the green bowl and fewer insects being drawn to the blue bowl. Overall, we did not find that insects seemed to be attracted to color at these levels as our data seemed to not follow a strict pattern. These insects probably ended up in the dishes they did more by chance than attraction itself. In order to improve our study we would increase the duration of time the bowls are left out and repeat the collections at each level multiple times to see if a correlation could be found.

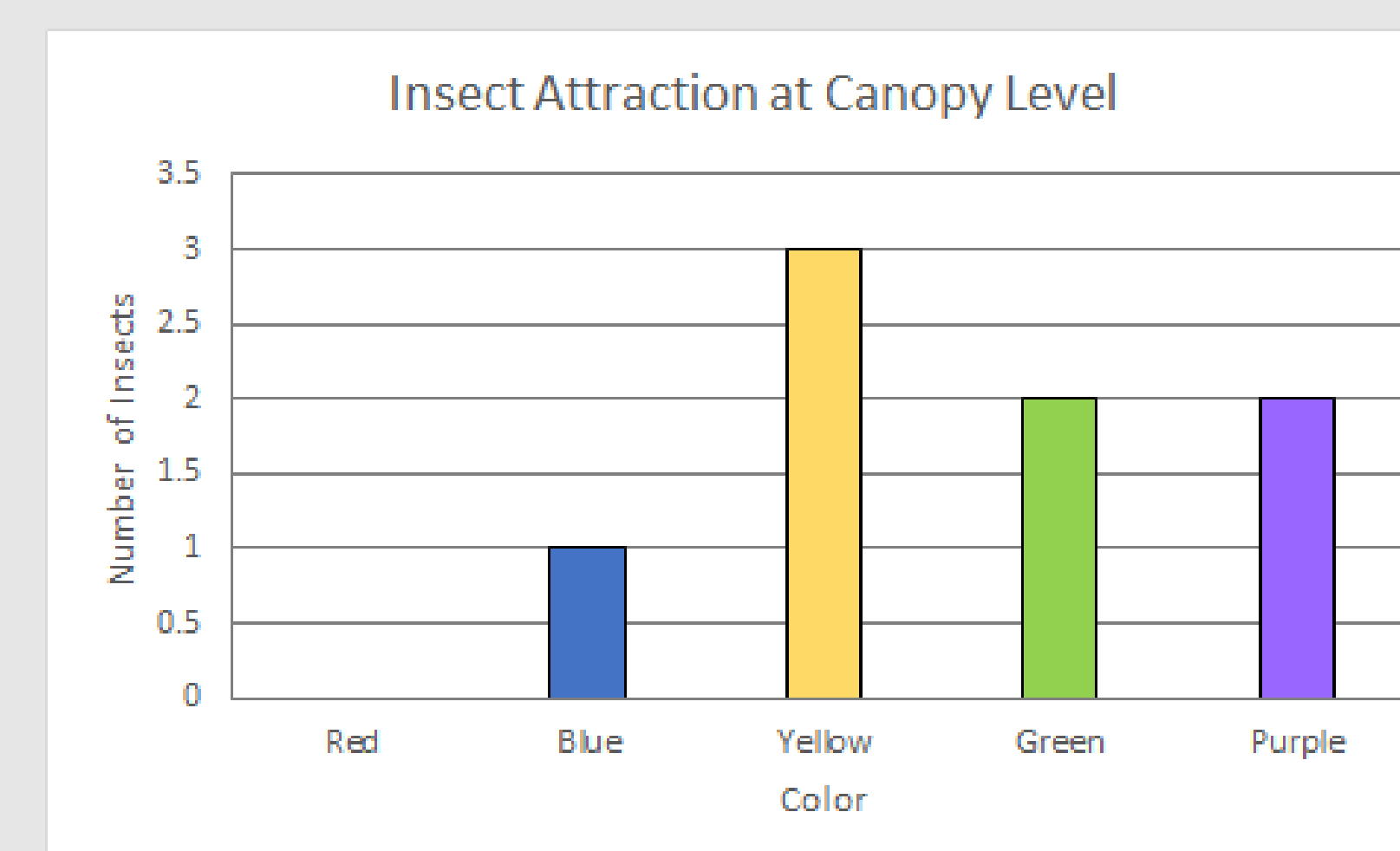


Figure 1: The following graph represents the insects found in each color bowl at Canopy level. Data was collected at the top of the observation tower at BFREE (n=1).

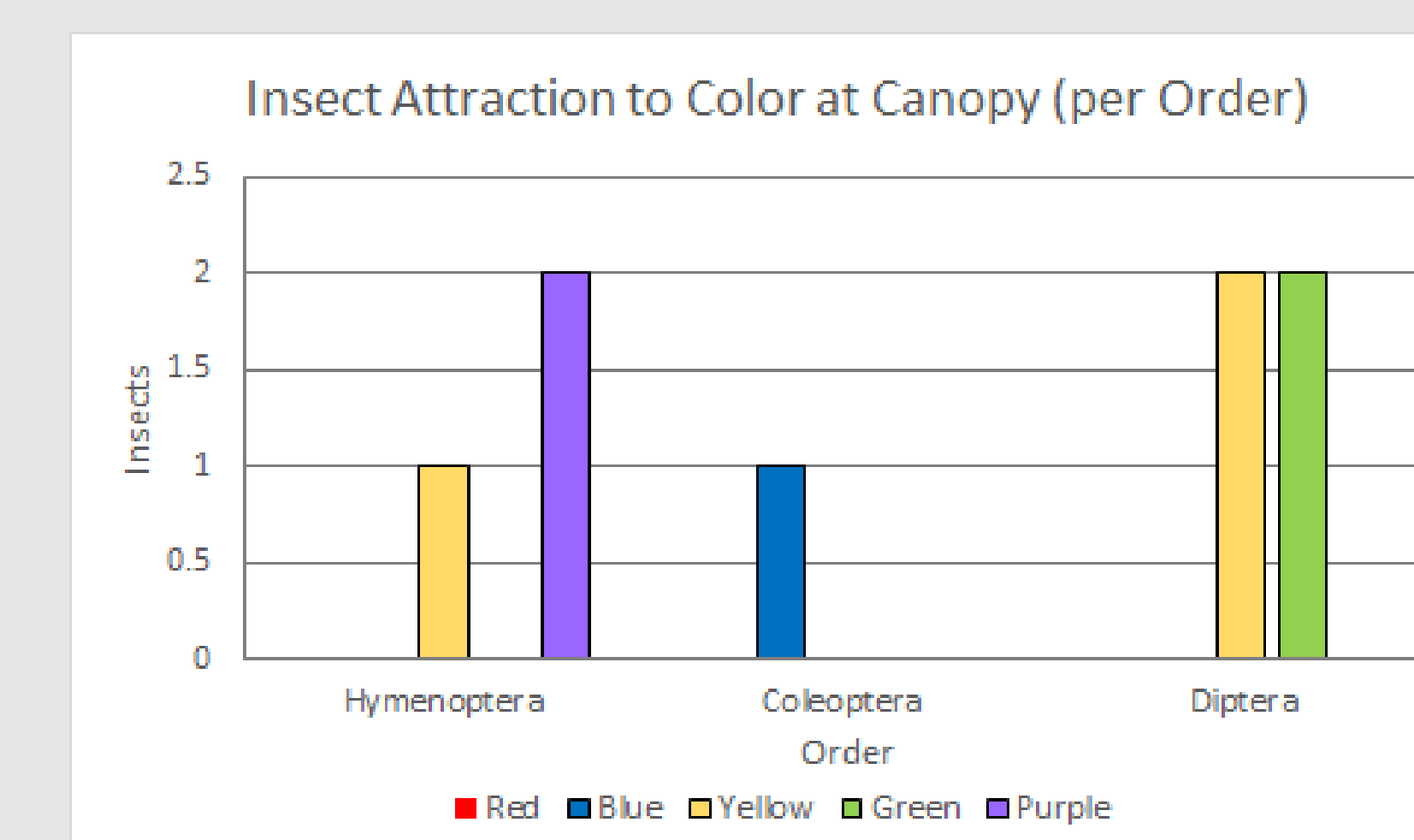


Figure 1: The following graph represents the Order of insects found in each color bowl at Canopy level. Data was collected at the top of the observation tower at BFREE (n=1).

FISH BEHAVIOR IN BELIZE RIVER VS WHITE CREEK AT BFREE

BY: TROY LUCAS & AMBER RUDOLPH

Fish Species in Belize River

- Billum (Central Tetra)
- Goby
- Blue-Eyed Cichlid
- Tuba (BlackBelt Cichlid)

Fish Species in White Creek

- Billum (Central Tetra)
- Blue-Eyed Cichlid
- Pike Killifish
- Green Swordtail
- Sleek Mostquitofish

OBSERVATIONS:

The billums in the river would swarm around people and follow them and would even nibble at them. They were seen all over the water column. The blue-eyed cichlids stayed towards the bottom and would eat vegetation off rocks and detritus. The single goby seen was towards the bottom swimming away from the commotion cause by the swimming. The tubas were only seen in a pair together inside a small crater. They stayed upstream, away from the other fish seen.

The billums in the creek did not notice the swimmers and moved around the water eating mainly from the top. The blue-eyed cichlids acted similarly to the ones in the river. The pike killifish stuck towards the edge of the creek under shade and would strike quickly at prey. The swordtail was only seen once swimming around an area where water was flowing at a faster rate. The mostquitofish would sit towards the top of the water eating detritus floating.

Conclusion: The lack of similarity in species makes it difficult to compare the behavior in the two locations. The blue-eyed cichlids acted almost identically whereas the billums were much more social with the swimmers in the river.

SCORPION HABITAT AT BFREE

BY: AMBER RUDOLPH

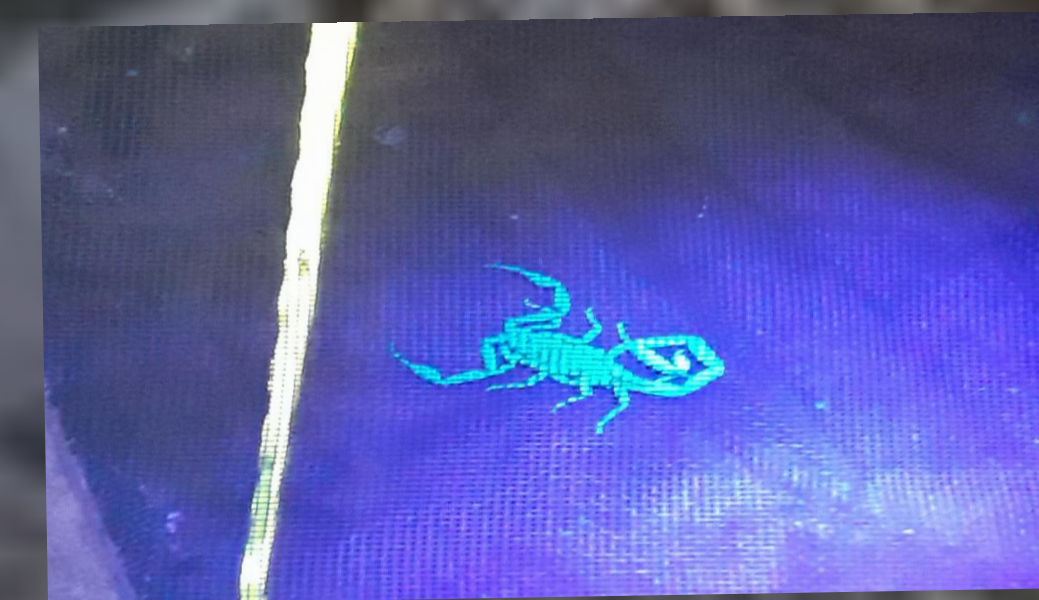
QUESTION: Where do the scorpions within BEFREE reside?

BACKGROUND: Scorpions will either be found burrowing in the desert, found around and/or in buildings or when near bodies of water under rocks.

METHODS: Looked twice a day for scorpions both at night and in the morning for four days. The areas of study included bed the river and around BEFREE buildings.

RESULTS:

- Only two scorpions were found during the day – Found in a dark building.
- Scorpions were most found at night near buildings or under the tarps by the buildings; they were found via black light since they glow under black light or by regular flashlights.



Conclusion: Scorpions within BEFREE like darker areas in buildings, around buildings or under items where they can stay dry; they do not like going near the water. During our stay it was extremely rainy; I believe this is why I did not receive too much data.

Observing BREE Wildlife Utilizing Camera Traps

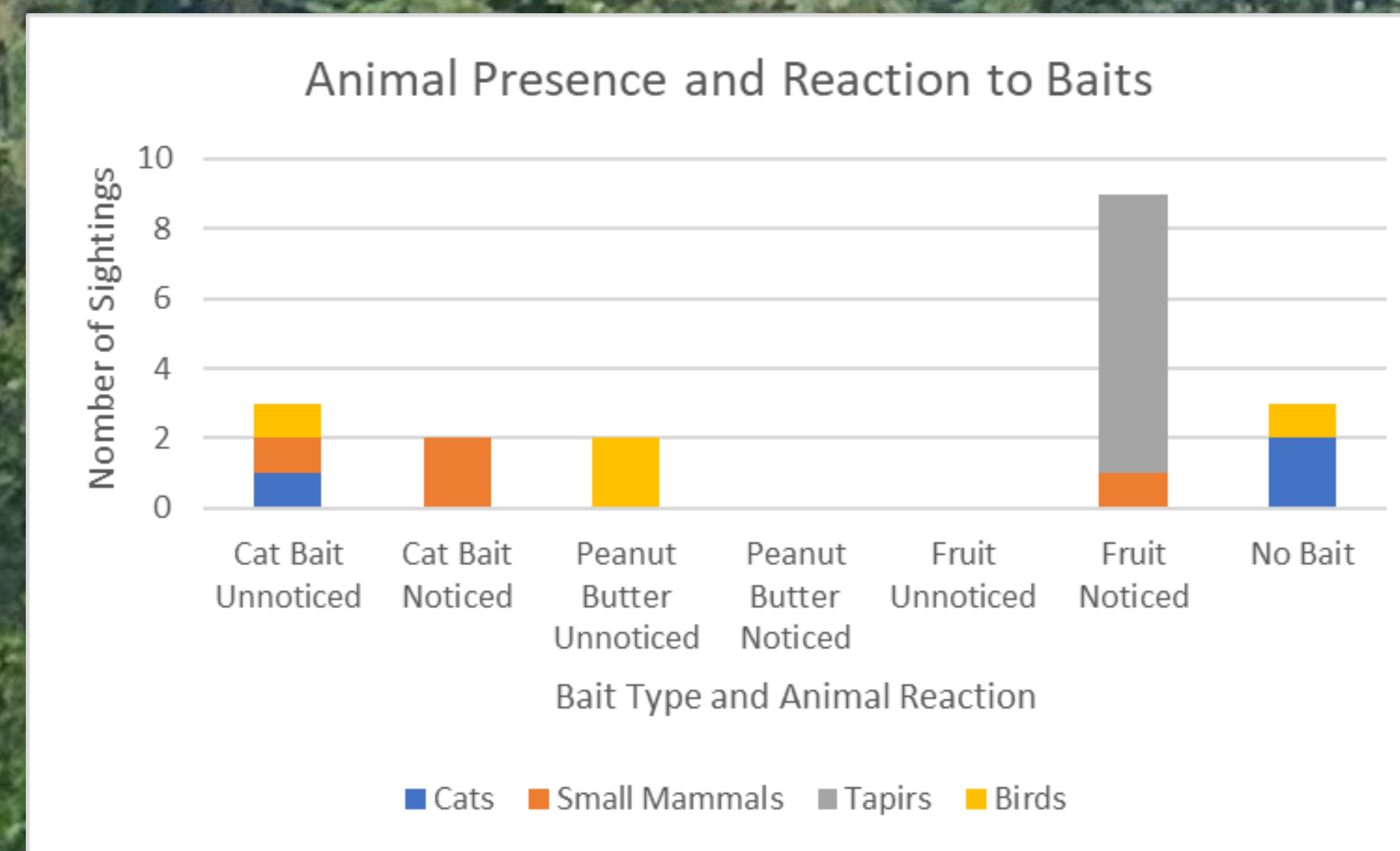
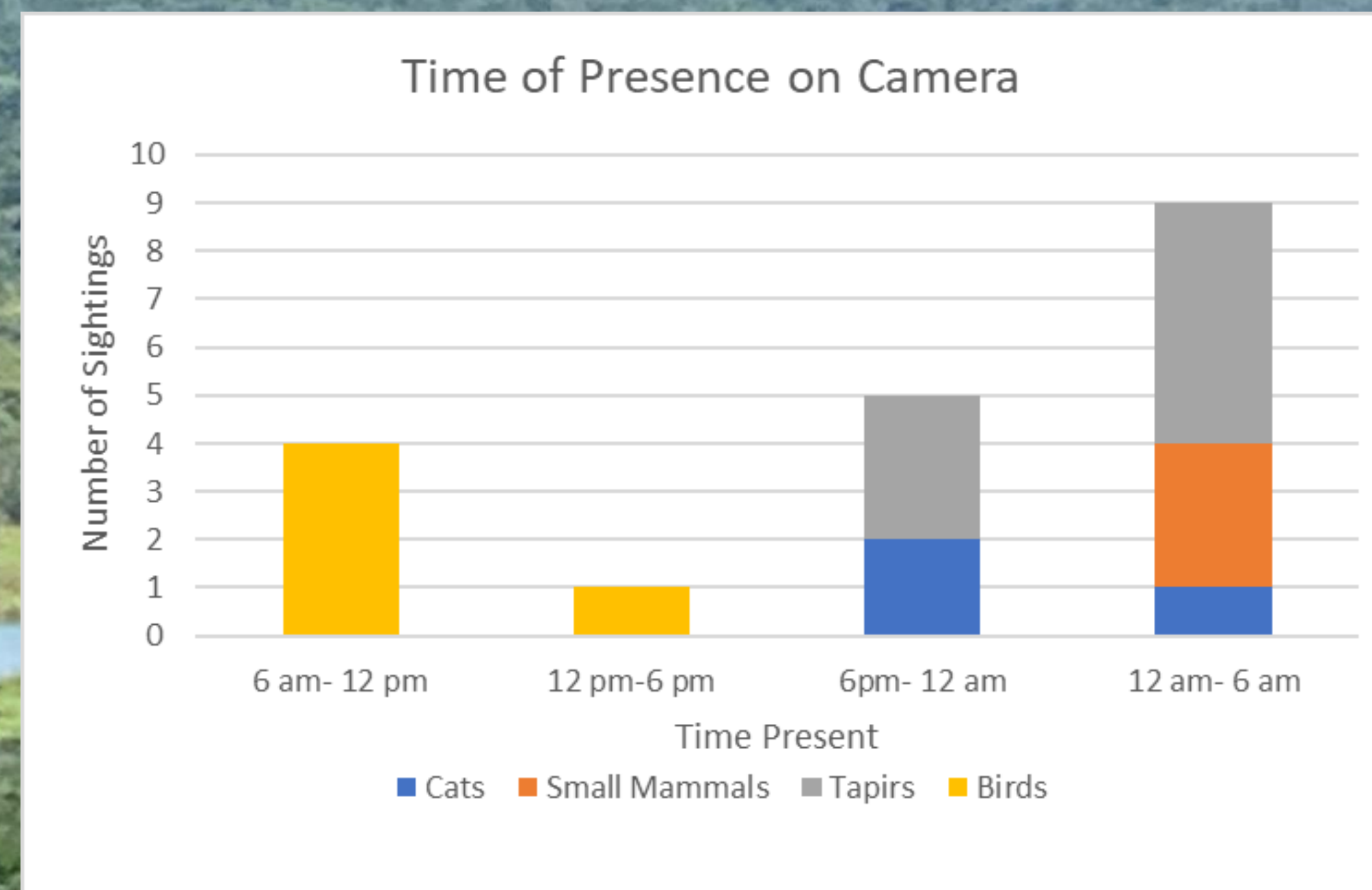
Sarah Simmons

Question:

What factors can be used to predict wildlife presence on camera traps at BREE?

Methods:

While at BFREE I used camera traps to assess what factors contributed to the likelihood of seeing animals on camera traps. I placed four cameras in various places around BFREE. The cameras recorded one image every minute and five additional images at one second intervals when motion was detected. Some camera traps were baited and some were not..



Discussion:

While the differences between animals present at different bait types was inconclusive due to the bait not being acknowledged in many instances, time of day did indicate what types of animals would be viewed on the camera.

The Bats of BFREE, an Observational Study

Vincenzo Bonaiuto

Question:

What species of bats are found in the different locations around BFREE?

Methods:

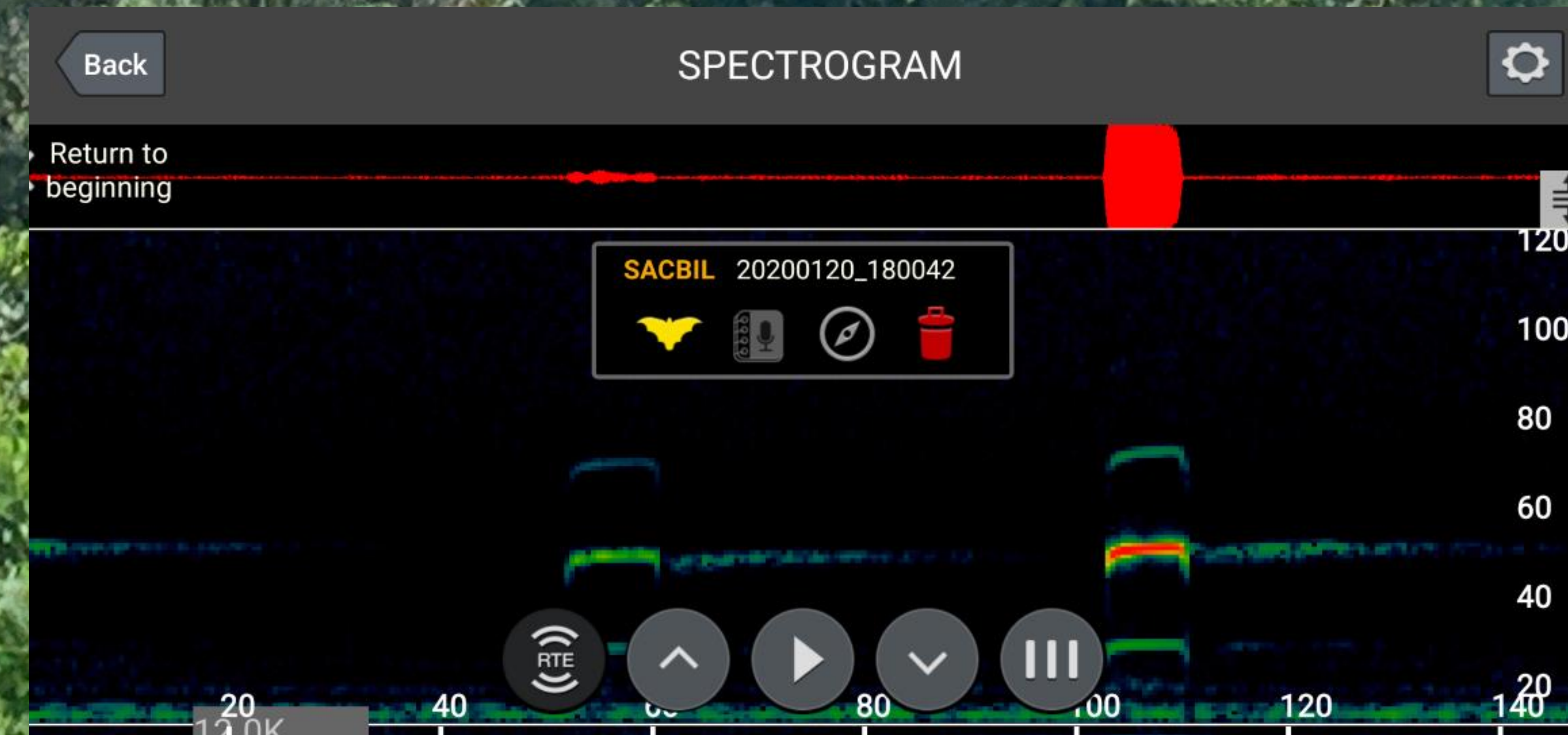
While staying in BFREE I used a bat detector (Echo Meter Touch Ultrasonic) in order to record calls of different species of bat's found in the river area versus the garden area. I would wake up at 5:30 am to make my way down to the river and the garden to start a 20-minute recording session. At around 5:30 at night I would make my way back to the site and do another 20-minute recording.

Results:

I recorded 19 different species of bats. Of these, nine were found in both locales, six were found exclusively at the river, and four exclusively in the garden.

Discussion:

The device I used was not 100% accurate, as there were many factors that could disrupt the recordings. For the first morning the sound of the river alone prevented any bats from being heard, and some bats have very similar calls that only a bat expert would be able to differentiate.



Garden

- Western Mastiff
- Parnell's Mustached
- Wagner's Mustached
- Greater Dog-like

Both

- Black Mastiff
- Least Sac-Winged
- Lesser Sac-Winged
- Greater Sac-Winged
- Northern Ghost
- California Myotis
- Greater Bulldog
- Desert Red
- Yucatan Yellow

River

- Silver Hair Myotis
- Big Crested Mastiff
- Riparian Myotis
- Van Gelder's
- Mexican Free-Tailed
- Black Myotis