

The Forman Rainforest Team Analysis of Costa Rica's Bird Populations at Pre-Montaine and Montaine

Abstract

The trends in the data we found in Las Cruces and Cuerici, not only highlight immediate ecological dynamics but also contribute to long-term studies on migratory patterns and the effects of climate change, aiding in predictive modeling and informed conservation strategies. Preliminary data from Las Cruces reveal that most captured birds were small, corresponding to band sizes A and B, and an encouraging balance in male and female bird populations suggests healthy mating prospects. In Cuerici, the team observed a significant skew in sex ratios, with 90% of captured birds being male, echoing concerning trends from previous years.

Introduction

The bird team is the longest-standing team within the Forman Rainforest Project. 2024 will be the 31st anniversary of the initiation of the project. The Birds team this year consists of 3 members: Hayden Senst '24, Ezra McNally '24, and Penelope Jackson '24. Our mission is to research the population of migratory birds in Costa Rica and the percentage of bird species that are threatened or endangered. Costa Rica is home to 850 species of birds, with 630 being native species and 22 being endangered species. The team is interested in continuing the 2020 Rainforest Project team's research. The data they found in Ceurcei was that 90% of the birds they caught were males, drastically affecting the rainforest's population. We aim to assist in protecting the endangered bird species from extinction by collecting data and closely monitoring the population. This process starts with catching and banding them, then finding out if they will

return to the same location next year. We keep track of these species and send our data to Cornell Lab of Ornithology to inform the status of whether any more species are endangered or extinct.

Procedures

The Birds Team employs mist nets in the Costa Rican rainforest to capture various birds daily. Tracking migratory bird patterns and tagging local birds are our goals. We utilize the following to put up these mist nets: Two poles, a mist net, two steel rebar, a rope, and two stakes. The mist net's threads are thin, and the nets we use are not too tight, allowing the birds to fall into their pockets without getting hurt. In order to prevent a larger bird from flying through the net and taking off with it, the stakes must be driven deep enough so that rain cannot wash it away with the dirt.

Data

Our results in Costa Rica this year were extensive, and to help with analysis we split them up into the two locations: Las Cruces and Cuertici. These data sets are easily evaluated with visual charts and can give us extensive information about the populations at each location individually. The first set that we evaluated was Las Cruces, and the first piece of data that we analyzed was of the band size. What we noticed was that most birds were small, corresponding to a smaller band size, A and B (see fig. 3) This makes sense, since we had our nets closer to the ground, but can also give us a good idea of what kinds of birds we should expect when doing surveys in the future. The second important piece of data that we analyzed was species' sex. We found that Male and Female birds rates were relatively common in our data set, which gives us confidence that mating should proceed as usual in the upcoming mating seasons. (See fig. 4) At Cuertici, we

could come to many of the same conclusions. Once again, band sizes retained the pattern of staying in the smaller range, however there were many more B bands present at Cuerici which lead us to believe that more of the birds hunted and fed on the forest floor as often birds that do that are more likely to have thicker legs. (See fig 5) Male and female rates were, again, similar. (See Fig)This gives us hope that the rates of males to females have returned to normal, though we hope that through more years of research and data gathering at Cuerici, this can be confirmed. Throughout our two weeks in Costa Rica, we gathered data on over 150 birds and 70 species as seen in our data spreadsheet.

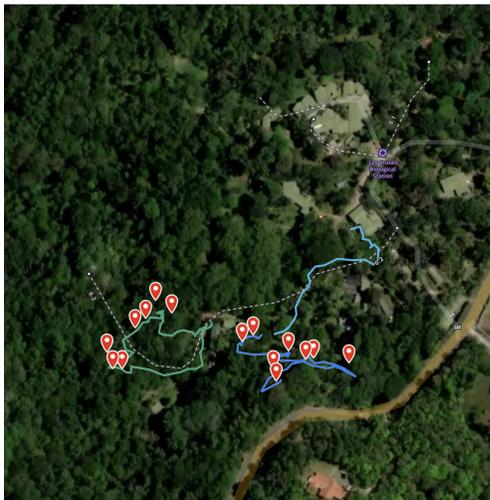


Figure 1.

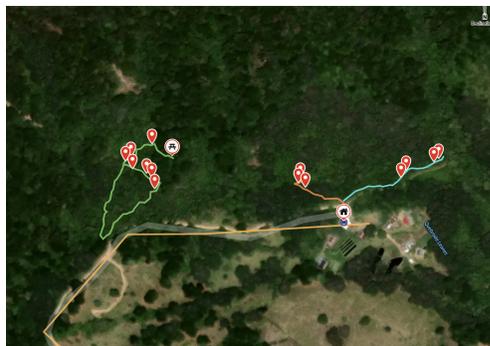


Figure 2.

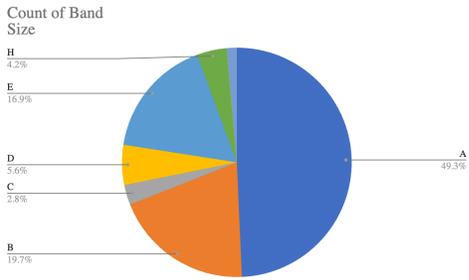


Figure 3.

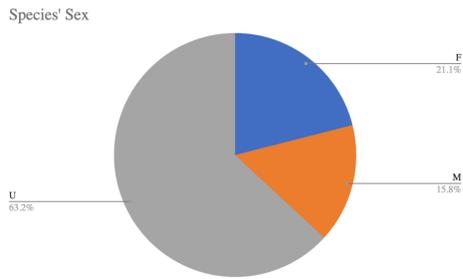


Figure 4.

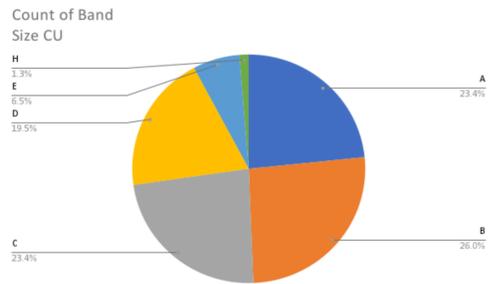


Figure 5.

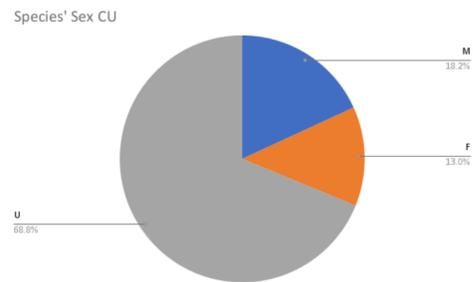


Figure 6.

Discussion

Every year that the rainforest project takes action, the research compounds among the preceding team's data. Thus, our research this year did not start from scratch but from the foundation of the last 29 years of the Birds team's work; this will be a recurring pattern following next year's team and so forth. For instance, each location has a specific amount of each species we caught, along with the exact size, weight, etc. Therefore, when succeeding teams execute their research, our previous data can be considered by comparing the two— deriving thoughts and analysis that could not otherwise be raised. However, the specific data we took differs in significance to succeeding research depending on the studied location. Nevertheless, general data like the count of migrants, signs of breeding, and other factors relating to migratory patterns will be helpful to any following data.

The Birds Team of the Forman Rainforest Project seeks to persist in our annual cumulative research to ensure that each new team builds upon the comprehensive foundation of data collected over the last 29 years. This consistent process enables the possibilities for the identification of long-term trends in bird populations, health, and behavior. Additionally, it facilitates more minute examinations of climate change and its impacts on migratory patterns. Our specific data may fluctuate in its immediate applicability; however, from a larger perspective, it works as an extensive effort to contribute to a larger picture when viewed over time.

Moreover, the data collected from our time in the rainforest aims to enhance the accuracy of general predictive models regarding bird migration. Our applied research also provides a strong foundation for conservation strategies and policy-making by continually updating and refining our data. In addition, future bird team members will work together by delving deeper into

specific ecological questions, guided by the longitudinal research conducted in preceding years of research.