Effect of Urbanization on Bird Species Richness in North Carolina

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Introduction

In recent decades, the need for more urbanization has grown significantly due to the increase in human population. Because of that, the environment has been greatly affected which has led to the loss of biodiversity (Hensley, B., C., 2019). Many are concerned that this rapid increase will soon lead to more environmental issues that will not be possible to reverse. While urbanization is necessary for human development, the environmental impacts seem to be greater than expected and seem to be causing more of a potential threat to the species present (Aronson, M. F. J., La Sorte, F. A., Nilon, C. H., Katti, M., Goddard, M. A., Lepczyk, C. A., … Winter, M., 2014). Pollution (noise, air, water, etc.), loss of resources, and other factors all play into the impacts on bird diversity which is why the question has come up: how does urbanization affect the amount of bird species in an area. Past studies show that more urban areas attract less bird species due to the scarce amount of necessary resources, while others show no change (McKinney, 2008). If there is more urbanization, then there will be less bird species diversity. There will be less birds around the areas with more people and urbanization. The purpose of this experiment is to evaluate how this rise in urbanization has affected bird species in North Carolina's cities versus protected areas.

Methods

The effect of urbanization on bird species richness was chosen to be the focus for the experiment. The procedure was done using the website, http://ebird.org/content/ebird, provided in the documents. Using the website, research was conducted on several places throughout North Carolina's urban areas (primarily near the middle of the state) as well as state park/preserved

areas in the middle to coastal regions of the state. While searching for the urban areas, all locations had to have some human impact such as churches, cities, universities, hospitals, etc. North Carolina only had 40 state parks, so it made it difficult to find come in certain areas of the state, but overall there were plenty for the experiment. When searching for the state parks, the name had to include "national reserve" or "state park" or show that it was intended for preservation. This was crucial when finding state parks because there needed to be a clear difference in the habitats. After finding all of the areas needed and filling the charts with the information, calculations were made to find the mean, standard deviation, and standard error for both the urban areas and state parks and put into a graph (Figure 1). I used the website http://graphpad.com/quickcalcs/ttest1.cfm to calculate the values and Microsoft Excel application to form my graph.

Results

Most of the instances showed that the birds did prefer state regulated/protected areas. Because of that, the hypothesis was supported due to the p-value of 0.0729 which showed that it was a significant change. The t-value was 1.8152. The city had a mean of 83.63 species which is slightly less than the state park mean of 113.10 species. The p-value showed that the difference was significant, which supports the hypothesis. That means that birds are more likely to migrate towards areas that are more rural. Urbanization makes it harder for bird species because of the scarce amount of resources available for them, especially if they require certain plants or organisms that can't live in areas populated by humans. These results prove that urbanization does have an effect on birds and their likelihood to live in or near human cities.

Discussion

Overall, the data provided the information that was needed from this test. The hypothesis was supported because the data showed that birds are more likely to live near state parks rather than urban cities (McKinney, 2008). That means that birds are more likely to migrate towards areas that are more rural. Urbanization makes it harder for bird species because of the scarce amount of resources available for them, especially if they require certain plants or organisms that can't live in areas populated by humans. These results prove that urbanization does have an effect on birds and their likelihood to live in or near human cities. Some weaknesses in the experiment could be that North Carolina has a limited number of state parks, which makes it less of a variety of places because a lot of the parks were in similar areas. Also, the information was only from one website, which makes it hard to get a good idea if it was accurate or up to date or not. In the future, it would be better if the state had more of a variety of cities and parks to get a better reading of the reaction of bird diversity in cities versus state regulated areas. Also, there should be more studies on what types of factors make birds want to be away from certain areas. Things that could be tested are noise, air pollution, humans, and structures blocking their paths. These tests would help make the experiment seem more factual instead of just doing the research.

References

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Figure 1.

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