Evaluating the Effect of Park Size on Species Richness in NYC Parks

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Introduction

Urban parks are crucial for biodiversity in cities, providing habitats amid urbanization, which often leads to habitat loss and fragmentation (Liu et al., 2016). Larger parks with diverse habitats are shown to support higher species richness (von der Lippe et al., 2020; Pregitzer & Bradford, 2023). This study uses BioBlitz data to examine how park size, habitat variety, and urban surroundings influence species diversity in NYC parks.

Question

How does park size and habitat variety influence species diversity in NYC parks?

Methods

All data was collected from iNaturalist using previous BioBlitz data and public observations. BioBlitz data was used for nine parks, while public observations on iNaturalist were used for six. These observations were made between June 1 and September 30 from 2020 to 2024. We collected species counts for both plants and insects and compared it with park size data from NYC Parks. Scatterplots were used to determine if a correlation between park size and species count exists.

Results

Park Name	Park Size (acres)	Plants	Insects	Total
Brooklyn Bridge Park - BB	85	101	82	183
Crotona Park	127.5	92	202	294
Inwood Hill Park - BB	196	116	86	202
New York Botanical Garden - BB	250	90	159	249
Cunningham Park	358	102	47	149
Green-Wood Cemetery - BB	478	197	189	386
Randalls Island - BB	480	164	153	317
Prospect Park - BB	526	149	110	259
Alley Pond Park - BB	655	227	153	380
Marine Park	800	304	276	580
Central Park - BB	843	256	188	444
Flushing Meadows Corona Park	898	142	79	221
Van Cortlandt Park - BB	1,146	124	166	290
Greenbelt	2316	408	619	1027
Pelham Bay Park	2,772	395	729	1124

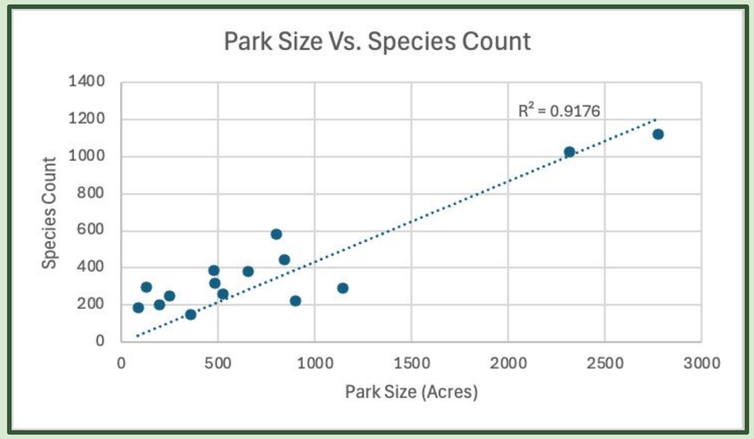
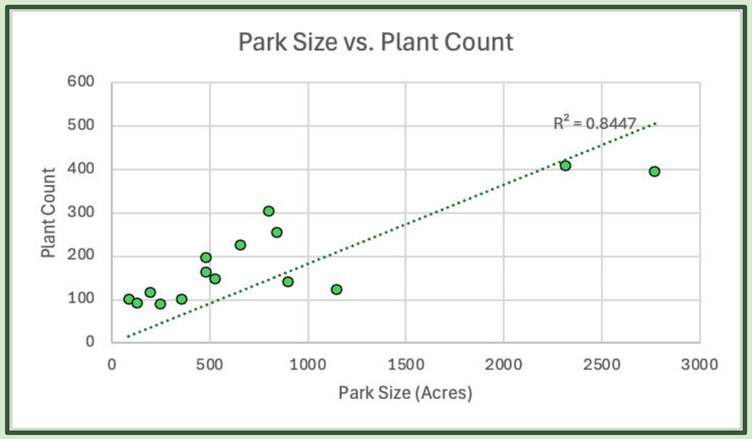


Figure 1: Table of selected parks to the left with corresponding size data and species counts. Parks with data taken from previous BioBlitz events are labeled with "BB". Data for the rest are taken from public observations on iNaturalist between June 1 and September 30 during the years 2020 to 2024 to approximately represent BioBlitz data. Scatterplot on the right depicts relationship between the two variables. With an R^2 value of 0.9176, 91.76% of the variation in species count can be explained by the park sizes. Square rooting R^2 will give us r, the correlation coefficient, which is 0.9574. This indicates a very strong positive correlation between park size and total species count.



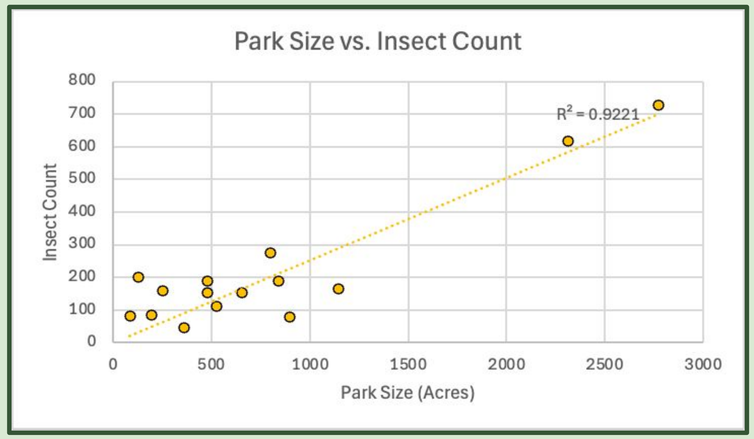


Figure 2: Scatterplots depicting the relationship between the park sizes and species types. To the left, the relationship between park size and plant count is shown, with an R^2 value of 0.8477. This indicates that 84.47% of the variation in plant count can be explained by the park sizes. Square rooting the R^2 will give us r, the correlation coefficient, which is 0.9191. This indicates a very strong positive correlation between park size and plant count. To the right, the relationship between park size and insect count is shown, with an R^2 value of 0.9221. This indicates that 92.21% of the variation in insect count can be explained by the park sizes. Our correlation coefficient, r, is 0.9603, which indicates a very strong positive correlation between park size and insect count.

Conclusion

The results of our study show that larger parks in NYC generally host a higher species count, although there is considerable variability, with some smaller parks also supporting a notable number of species.

Future Works

Would add on by researching other external influences apart from park size, which could influence species diversity in parks.

Park Location: can be a suitable location that could promote biodiversity and support a multitude of species.

Urban Connectivity: Surrounding Environmental Conditions: The surrounding environment could affect habitat quality for species.

Works Cited

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