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Tacoma's Luxury Effect and the Ecological Influence of the Green Schoolyards Initiative

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Abstract

This project examines changes in bird diversity that Tacoma's "Green Schoolyards" initiative will promote, which intends to introduce native plants into low-income neighborhoods lacking diverse green spaces. I predicted habitat changes resulting from the Green Schoolyards program will increase ecological diversity in low-income neighborhoods. I have framed the results of this research in the context of the luxury effect, which I hypothesized is a major factor in the ecological distribution of wildlife in Tacoma, WA.

Introduction

Urban low-income areas, including those in Tacoma, typically lack local access to ecologically diverse green areas (Schell et al., 2020). Without access to viable habitats, the diversity of native species that rely on functional plant communities declines in densely urbanized areas (Lepczyk 2017). To address these issues, Tacoma announced the "Green Schoolyards" initiative to revegetate low-income elementary schoolyards in fall 2021, creating more accessible green spaces, establishing viable urban habitats and improving human well-being ("Trust for Public Land Launches Program to Improve Schoolyards across Tacoma." 2020).

Objectives

- Identify the impact of Tacoma's luxury effect on ecological diversity by quantifying avian species richness and diversity in parks, schoolyards and surrounding neighborhoods across the city.
- Determine if luxury effect ecology corresponds with median neighborhood income levels.
- Determine if the Green Schoolyards initiative generates changes in bird communities in low-income areas.

Materials & Methods

- Three different urban habitat types within Tacoma (Figure 1):
 1. Five elementary schoolyards selected for improvement: Stafford, Reed, Mann, Larchmont, and Whitman
 2. Neighborhoods surrounding each schoolyard
 3. Five open-space, recreational parks: Vassault, Jefferson, Kandle, Garfield and Norpoint.
- Standard terrestrial bird point counts using a 20-meter circular radius plot. At each site, three random locations were established for each 20-minute point count survey.
- Habitat characterization conducted at each location, noting foliage/canopy species prevalent in area.
- Results calculated using Kruskal-Wallis tests in Rstudio.

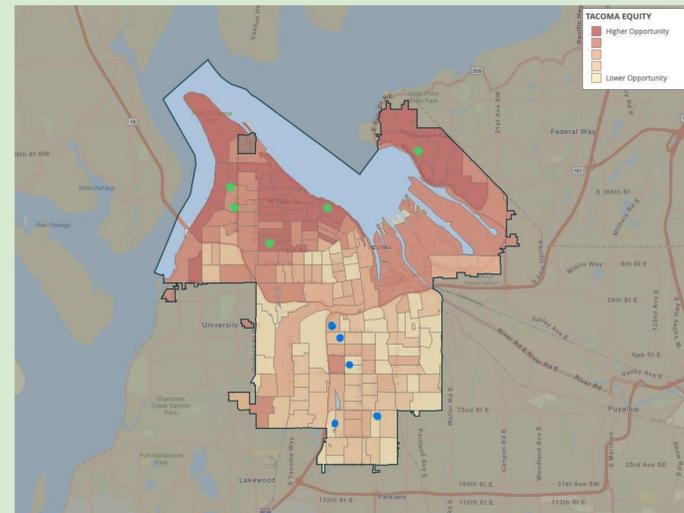


Figure 1. Distribution of selected survey sites around the greater Tacoma area, overlaid upon a map of the city's 2020 equity index as calculated by cityoftacoma.org. Highest income areas are represented in dark red, lower levels are pale yellow. Surveyed schoolyards are indicated with blue dots, and parks with green.

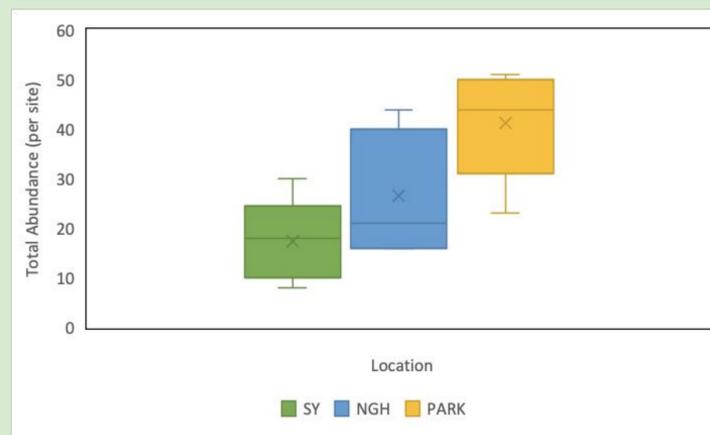


Figure 2. Avian abundance (# of birds per survey site) in three different habitat types in Tacoma: schoolyards (SY: green), schoolyard neighborhoods (NGH: blue), and parks (PARK: yellow). Abundance varied as a function of habitat type ($\chi^2 = 7.24$, $p = 0.02$, $df = 2$).

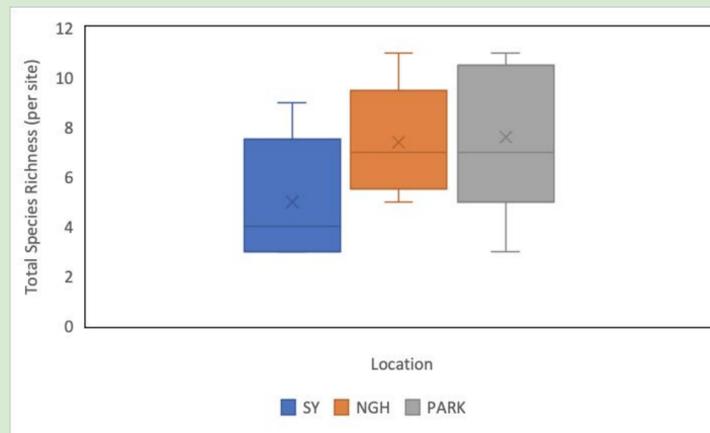


Figure 3. Avian species richness in three different habitat types in Tacoma: schoolyards (SY: blue), schoolyard neighborhoods (NGH: orange), and parks (PARK: gray). Species richness did not differ as a function of habitat type ($\chi^2 = 2.80$, $p = 0.24$, $df = 2$).

Results

- Preliminary data have been collected at schoolyards scheduled for improvement and will be compared to data collected following the schoolyard renovations (Figures 2 & 3).
- Avian abundance but not species richness differed between schoolyards, neighborhoods and parks ($p = 0.02$ and $p = 0.24$, respectively).
- Future analyses will compare avian abundance and species richness to habitat characteristics.

Conclusions

- Preliminary results suggest that the luxury effect contributes to patterns in avian abundance, but not species richness, within Tacoma.
- Increased spatial and temporal coverage of surveys will improve our ability to detect ecological patterns.
- Baseline data have been collected to measure aspects of the ecological impact of the Green Schoolyards initiative.

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Works Cited

1. Lepczyk, C. A., Aronson, M. F. J., Evans, K. L., Goddard, M. A., Lerman, S. B., & MacIvor, J. S. (2017). Biodiversity in the City: Fundamental Questions for Understanding the Ecology of Urban Green Spaces for Biodiversity Conservation. *BioScience*, 67(9), 799–807. <https://doi.org/10.1093/biosci/bix079>
2. Schell, C. J., Dyson, K., Fuentes, T. L., Des Roches, S., Harris, N. C., Miller, D. S., Woelfle-Erskine, C. A., & Lambert, M. R. (2020). The ecological and evolutionary consequences of systemic racism in urban environments. *Science (New York, N.Y.)*, 369(6510). <https://doi.org/10.1126/science.aay4497>
3. "The Trust for Public Land Launches Program to Improve Schoolyards across Tacoma." Metro Parks Tacoma, 18 Nov. 2020, www.metroparkstacoma.org/tpl-green-schoolyards/.