Relating urban heat island effect to avian diversity in connective matrices of Tacoma

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The urban heat island (UHI) effect, experienced disproportionately by neighborhoods of lower wealth and socioeconomic status, is one byproduct of global warming and urbanization known to have several health impacts (Fig. 1). Birds are considered strong indicators of the functionality and health of an ecosystem and are an excellent focal group for research which seeks to address potential connections between socioeconomic disparity, UHI, and urban biome health. There has been relatively little study on how birds utilize the urban matrix. Alleyways are one key structural element of the urban environment: often disregarded and underutilized tracts that serve to unite various segments of any city in many ways. I compared avian diversity and abundance in two elements of urban landscapes, alleyways and their associated streets, across different grades of environmental and socioeconomic disparity, UHI measurement, and/or historically redlined zones. This provided insight into the relationship between socioeconomic status, UHI effect, environmental health, and local biodiversity.

RESEARCH OBJECTIVES

- Determine if a relationship exists between UHI, socioeconomic status, and biodiversity, as measured by avian diversity and abundance.
- Compare avian diversity and abundance in alleyways and adjacent streets between UHI and non-UHI areas.
- Build a foundation for future research to evaluate the role of alleyways within complex urban ecosystems.

MATERIALS AND METHODS

- Eight study sites distributed across multiple socio-economic areas of Tacoma, WA. Each study site was comprised of an alley and its associated street.
- Two-block walking transects of both alley and street for each site were conducted twice weekly from June through August.
- To control for time of day effects on avian activity, I conducted all surveys between 0700-0900h.
- I recorded the identification and abundance of all bird species seen and heard within each transect area.

PRELIMINARY RESULTS

<table>
<thead>
<tr>
<th>Location</th>
<th>Average Avian Abundance</th>
<th>Average Species Diversity</th>
<th>Min No. Species Seen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alleyways</td>
<td>120</td>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td>Streets</td>
<td>140</td>
<td>5</td>
<td>70</td>
</tr>
</tbody>
</table>

Initial analyses suggest that:
- Alleyways contain higher avian diversity and avian abundance.
- A relationship may exist between environmental disparity rank and species diversity.

REFERENCES


ACKNOWLEDGMENTS

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