

PS 29-187 - One Swallow Does Not an Ecosystem Make: Using Avian Diversity to Guide Urban Forest Management

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Background/Question/Methods

As urban populations exponentially grow, new and effective methods of assessing the health of urban ecosystems are needed. Urban forests especially are known to provide a variety of services, including mediating urban heat island effect, diverting stormwater, and sequestering carbon. However, despite their social-ecological nature, conventional urban forest assessment methods focus on their social aspects and neglect ecological factors. Additionally, urban tree canopy (UTC) cover assessments, while a relatively simple and inexpensive method of urban forest evaluation, provide little predictive information regarding the structure and health of an urban forest. Even ecologically-grounded methods often suffer from lack of information, as street tree surveys offer an incomplete picture of the urban forest and private trees are difficult to survey. To correct this, I hoped to use available urban bird data to demonstrate correlation between bird diversity and urban forest function, sustainability, and health. I calculated the Shannon-Weiner diversity index for birds observed in the Audubon Society's Great Backyard Bird Count in several cities between 1998 and 2012 and calculated bird abundance from the number of birds reported per checklist in a year. I then compared these figures to the UTC, percent native species, tree diversity, tree density, and tree age distribution.

Results/Conclusions

Though UTC was significantly correlated with all avian population metrics, only percent native vegetation and tree density were correlated with avian diversity. This suggests that bird diversity is more closely related to the structure of the urban forest than to its diversity. Therefore, urban forest management authorities should continue to preferentially use native species in urban tree plantings, as biodiversity appears to be secondary to native abundance and native vegetation may be an indicator of ecosystem function and community engagement. This study highlights the need for ecological values to be factored into management strategies and proposes an assessment method that allows another potential inclusion of citizen science in the management of the urban forest, which may increase resident emotional investment in the urban forest, leading to a healthier and more sustainable ecosystem.