The Determinants of Song in an Urban Song Sparrow Population

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Introduction

Song Sparrows are an abundant and widespread songbird throughout North America, including urban habitats. Despite numerous studies on the species, little is known about how different environmental factors affect singing in this species. There are studies that show that behavioral syndromes such as aggressiveness and boldness exist in both urban and rural populations, but urban birds have more control over their response (Myers and Hyman 2016). We studied Song Sparrows in three different areas in the city of Cincinnati in order to assess whether singing rates differ among local populations. Study sites included the main campus of the University of Cincinnati, and two Corryville areas. We tested the hypothesis that singing rate in this species does not differ between territorial males in urban territories with sparse vegetation compared to singing males in greenspace.

We found no significant difference among singing rates among territorial males in the three locations, but also found few birds on the campus compared to the other locations. Response to song playback was weak among males in all locations, which merits additional study in an urban landscape, as the species is known to adjust song in urban environments compared to more rural landscapes.

https://www.birdsandblooms.com/birding/bird-species/sparrows/song-sparrow/

Methods

Male territorial Song Sparrows studied in three locations. These included the University of Cincinnati Main Campus with numerous buildings and limited green space; the Corryville community and along with Moerlein Avenue in Clifton. All these locations are in the city of Cincinnati, but each have different scales of urbanization and amount of green space. Data were collected using a standardized avian field data sheet and protocol (See Table 1). In 2022, data were collected from late January through early April, which corresponds to late winter/early spring territorial establishment and defense by the species. For each pair of Song Sparrows located, data collected included observation number, date, weather, start and end time during 20 minutes of observation: presence or absence of a female seen (see Table 1). Response to song playback in most territorial songbirds include searching for the intruding male, circling the territorial boundaries, and countersinging, and even combat and chasing away the intruding male.

Table 1. Song Sparrow Data Table/Field Form

Song Sparrow UC Research Project Data Sheet
DATE_____ Observer_____ ROUTE: (circle one): UC Corryville Burnet
Weather: VISIBILITY (circle one): good fair poor

CLOUD COVER (circle one): clear overcast partly sunny/cloudy sunny TEMP. (°F): High ____ Low ____

WIND DIRECTION (circle one): N NE E SE S SW W NW none SPEED (mph): Low____ High____

PPT: (circle one): none light rain heavy rain other

Obs. #	Loc.	Start Time	End Time	# Inds. (males)	Songs/ 15 min.	Singing Height (L M H)	Song Perch (tree/shrub spp.)	Female Presence/ Response/Duet/ Countersinging	Flight Height (m)	Song Playback (last 5 min. of 20 min.) – Response Y or N	Behavior S = Singing F = Foraging P = Perched FC = Fighting/ Chasing O = Other (e.g., preening, FY)

Comments and Notes between territories, etc.: _____

Results

Refer to Figure 1 and Table 2, where it shows the average song rate on the University of Cincinnati's campus was 8.93 songs per 20 minutes; then at Corryville, the average song rate was 8.68 songs per 20 minutes; lastly, on Moerlein Ave. the average song rate was 8.33 songs per 20 minutes. Thus, resulting to very little significant difference in song rates within the three different communities.

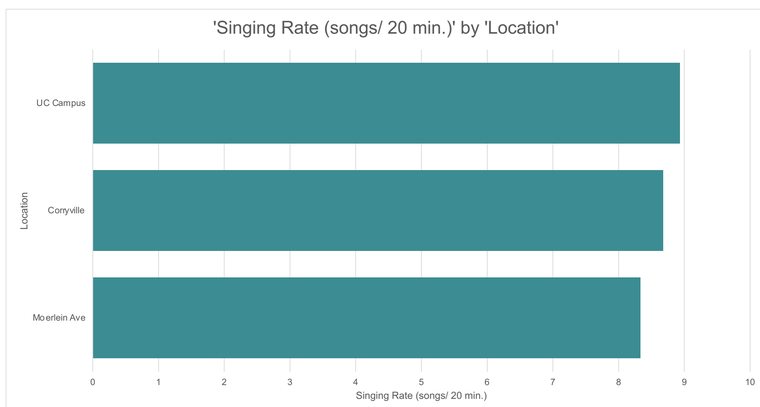

Figure 1: This graph shows the average song rates among the three locations

Table 2. The average song rates in each location

Location	Average of Singing Rate (songs/ 20 min.)
UC Campus	8.933333333
Corryville	8.676470588
Moerlein Ave	8.333333333
Grand Total	**8.63**

Overall, the data in Figure 2 shows that there is no significant difference among song rates across the different locations. The song rate did not appear to be dependent upon weather variation and other variables, such as perch height tested in this study, but more data over a longer time period may be needed to fully quantify the determinants of song, including quantification of urban noise.

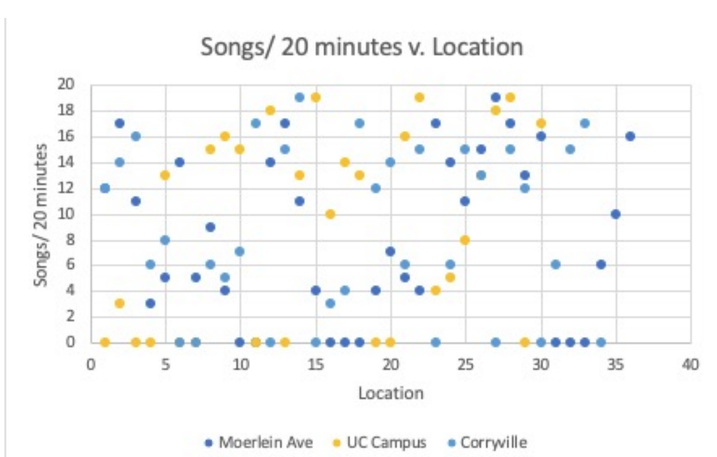

Figure 2:This graph represents the variety of song rates among three different locations.

Results (Cont.)

Additionally, the male Song Sparrow appears to prefer to sing more during the bright and sunny days during early spring when foraging and mate guarding. As shown in Figure 3, there were a few birds out on snowy days, but only a handful. They stayed hidden when there was any kind of precipitation such as, rain and especially snow.

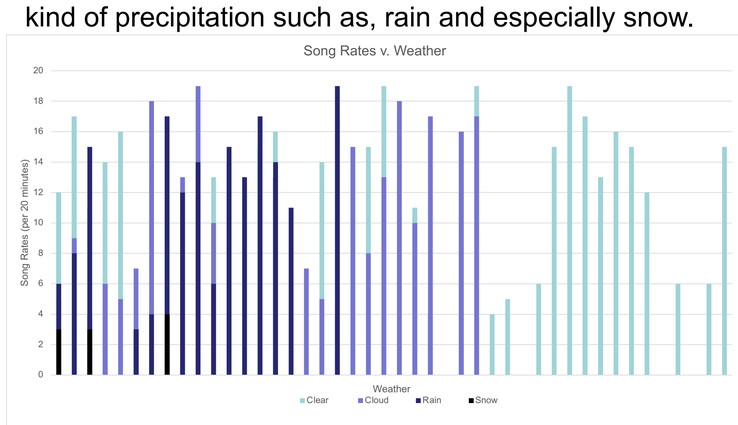

Figure 3: This bar chart shows the frequency of song rates in different types of weather in Cincinnati

Conclusion

In conclusion, the data collected supports my hypothesis of no difference in singing rates among the populations of the Song Sparrow in the urbanized Cincinnati landscape. There were no significant differences among singing rates among territorial males in the three locations. Numerous factors may affect when and how much Song Sparrows sing, which merits additional study. There was a strong preference for clear and sunny days, this was when the birds would sing the most. The average song rates were higher on UC's campus in comparison to Corryville and Moerlein Ave. However, it was expected to have higher average song rates off campus, the most residential area, Moerlein Ave seemed to have the least average song rates but not by much difference. There are a few sources of experimental error such as human error. The data is based off human hearing and there is chance of an estimation error when observing and hearing the song within the 20-minute time frame.

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References

Myers, R.E., Hyman, J. Differences in measures of boldness even when underlying behavioral syndromes are present in two populations of the song sparrow (Melospiza melodia). J Ethol 34, 197–206 (2016). https://doi.org/10.1007/s10164-016-0465-9