Lights Out Buckeyes – Factors Influencing Avian Window Collisions

Kandace Glanville

22 April 2019

ABSTRACT

Migratory songbirds migrate primarily at night. Artificial lighting disrupts this natural phenomenon by disorienting and drawing in birds that migrate through urban landscapes each spring and fall. In the United States, between 365 to 988 million birds are killed in window collisions each year (Loss 2014). I have sought to pinpoint exactly when, where, and why these collisions are occurring on campus. I led a team of researchers that consisted of students in the Ornithology Club at Ohio State. We monitored most buildings on The Ohio State University main campus for window collision birds. Our findings will hopefully inform and promote future university management decisions to mitigate window collisions on our college campus and other urban areas. In addition, this research will expand our knowledge of factors causing wildlife collisions and will lead to other Universities to follow in our footsteps. We recommend that glass be remediated, building and exterior lighting be turned off or dimmed at night during migration seasons, and future building plan regulations will call for safer architectural design for wildlife.

INTRODUCTION

Window collisions are the second leading cause of death to birds by direct human impact (NABCI 2014). Big cities like Chicago, Dallas, Houston, and Cleveland kill upwards of thousands of birds a year by window collisions alone. Though a small section of a large central city, we wanted to see what impact The Ohio State University campus is having on birds. We wanted to know how big of an impact campus is having: how many birds are being killed a season? With that data, we wanted to discover if there are any patterns in building parameters or features of campus that are causing these bird-building collisions. Are there any patterns in the collision rates of short-distance migrants (SDM), long-distance migrants (LDM), or residential species? We predicted that Ohio State main campus buildings will kill avian species, and that buildings with a larger surface area will kill more birds, as will North campus section buildings.

METHODS

Teams of 4-6 volunteers monitored most buildings on The Ohio State University main campus for window collision birds twice a week from August 20 to November 7, 2018. During this migration season, we accumulated approximately 250 hours of volunteer searching, totaling 95 miles of walking distance. In addition we recorded data on the species, time found, age and sex, and outcome for each bird. Live birds were taken to the Ohio Wildlife Center for rehabilitation and hopefully release, and dead birds were taken to the Ohio State University Museum of Biological Diversity to be made into study specimens. Building parameters such as height and perimeter for most campus buildings were accumulated using Google Earth and Emporis. Bird collision rates were acquired by migrant type, in addition to campus section and surface area.

Figure 1. An American Woodcock that was killed after colliding with the Ohio Stadium at The Ohio State University, Autumn 2018.

STUDY AREA

We monitored nearly all buildings on the main campus of The Ohio State University in Columbus, Ohio. Campus was divided into three sections: North (N = 71 buildings), Central (N = 20 buildings), and South (N = 59 buildings), as shown in Figure 2. Campus buildings West of the Olentangy River and North of Lane Avenue were excluded for convenience of monitoring.
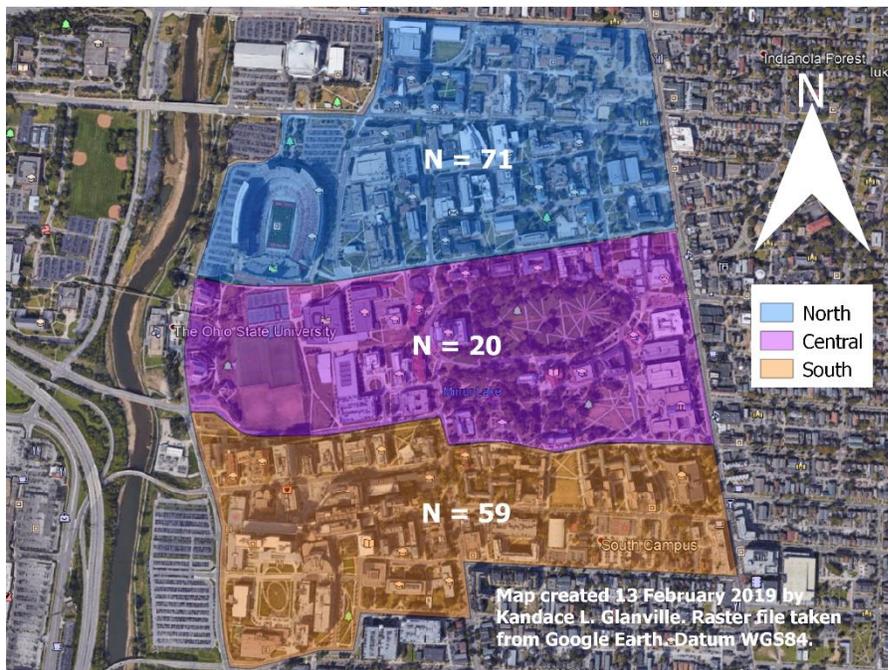

Figure 2. Map of The Ohio State University campus, broken into sections for collision comparisons.

RESULTS

161 collisions were documented from 20 August to 7 November 2018, from 49 campus buildings. During mid October, collision rates changed from mostly LDM to SDM as winter migrants moved in. The majority of collisions were documented from the north section of campus (52.8%), though central campus had the highest collision rate (Fig. 4). Building surface area does not appear to explain variation in collision rate as R^2 for all guilds was <0.01 (Fig. 5).
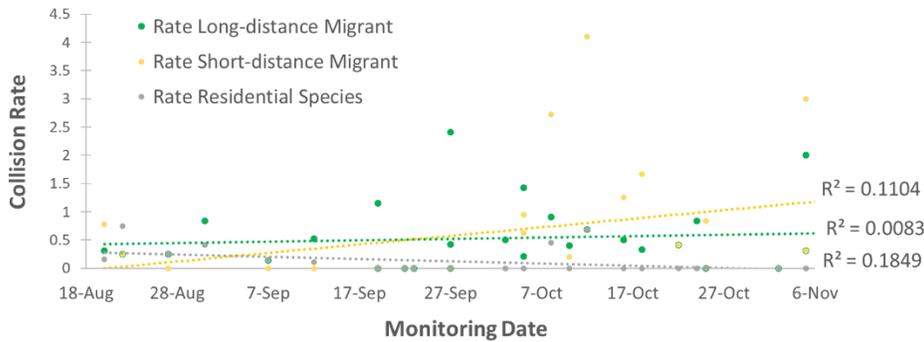

Figure 3. Rate of collision compared to type of migrant from fall 2018 Lights Out Buckeyes data from The Ohio State University.
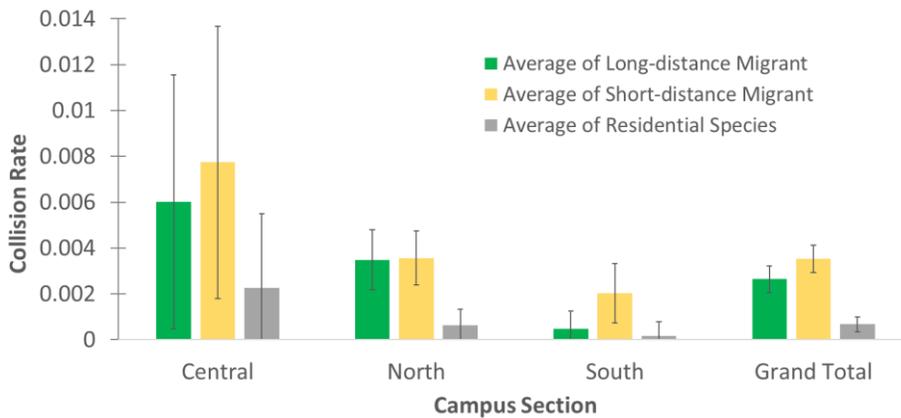

Figure 4. Collision rate compared to section of campus, from fall 2018 Lights Out Buckeyes data from The Ohio State University.
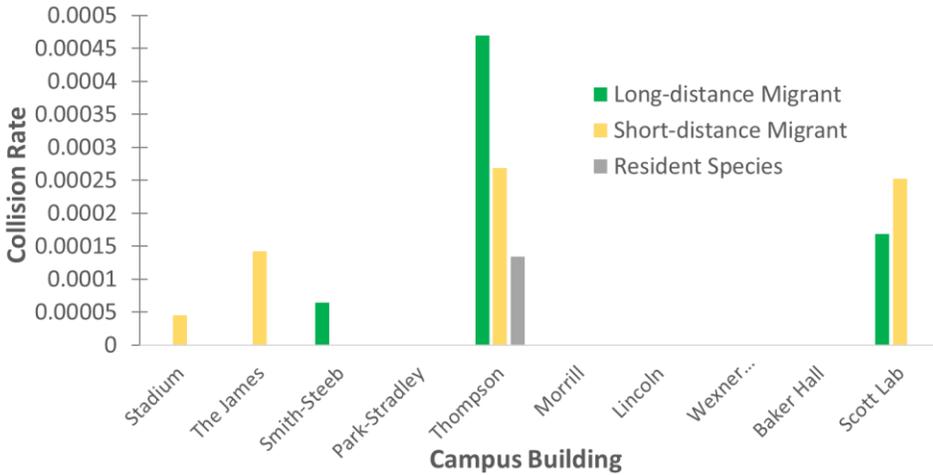
Figure 5. Top 10 buildings by surface area on campus at The Ohio State University compared to bird-window collisions from Lights Out Buckeyes fall 2018 data.
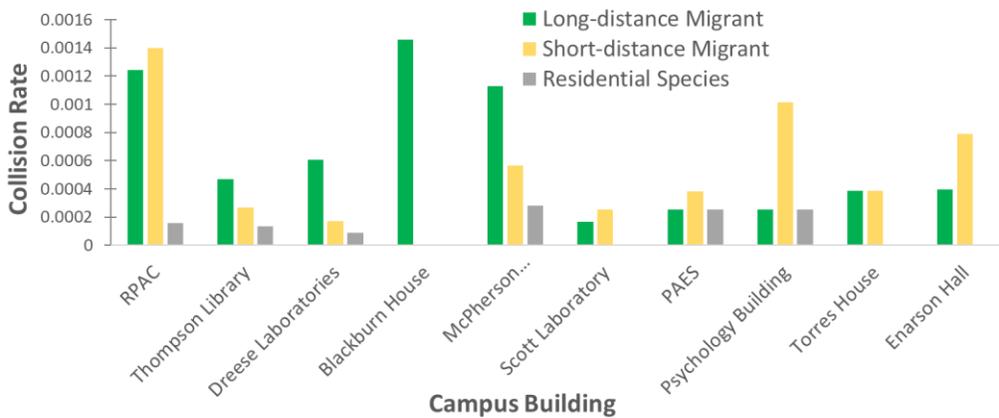

Figure 6. Top 10 buildings by number of collisions on campus at The Ohio State University compared to bird-window collisions from Lights Out Buckeyes fall 2018 data.

DISCUSSION

The top 10 buildings by surface area (see Figure 5) do not show any relation to high collision rates. We do not have evidence that surface area of buildings directly leads to avian-window collisions, but it may be more informative to measure surface area of glass. Central campus had the highest collision rate – because of the Oval and the available greenspace is what draws birds in? Majority of collision occurrences were migrant species, in comparison to residential. This is often the case because residential species are more aware of their territory and are used to being around those buildings – they learn to know that they are there. Migratory species are

entering unfamiliar territory for stopover on their route, and are more likely to collide with buildings because they are not familiar with the city and with those buildings.

We knew campus would be detrimental to birds, but we did not expect to find such a large impact (161 collisions in one season). What a large impact this has when you think about how there are hundreds of other college campuses in the United States alone, and they could be having an equally detrimental effect on our avian populations.

FUTURE OBJECTIVES

Determine campus-level influences on bird-building collisions on campus, such as distance from the Olentangy River, and amount of adjacent greenspace to a building. As well, we want our Lights Out Buckeyes initiative to outreach to The Ohio State University in addition to other Universities and demonstrate why they should care and do something about this issue. We recommend that glass be remediated, building and exterior lighting be turned off or dimmed at night during migration seasons, and future building plan regulations will call for safer architectural design for wildlife, such as reducing amount of glass and using bird-safe windows.

LITERATURE CITED

Emporis. "Low-Rise Buildings in Columbus." Emporis,

www.emporis.com/city/101043/columbus-oh-usa/type/low-rise-buildings.

Loss, S. R., Will, T., Loss, S. S., & Marra, P. P. (2014). Bird–building collisions in the United States: Estimates of annual mortality and species vulnerability. The Condor: Ornithological Applications, 116(1), 8-23.

North American Bird Conservation Initiative, U.S. Committee. 2014. The State of the Birds 2014 Report. U.S. Department of Interior, Washington, D.C. 16 pgs.

ACKNOWLEDGEMENTS