Effect of Bird Age on the Likelihood of Fatal Window Collisions at Utah State University's C&SS Building

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Introduction

Window collisions are the second highest anthropogenic cause of bird death in the US; window collisions kill 365,000,000 to 988,000,000[1] birds annually. Previously, researchers found that juveniles were more likely to fatally collide with windows than adults[2,3]. As part of our course, we investigated the association between bird age and the rate of fatal window collisions at Utah State University's Classroom and Student Services (C&SS) Building (shown below).

Methods

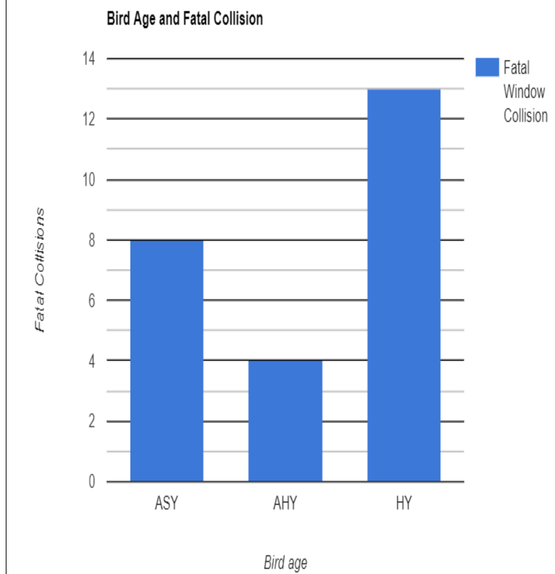
A 6-foot area around the outside of the C&SS Bldg. was inspected for evidence of fatal window collisions. If a bird carcass was found, the specimen was collected and frozen. In total, 25 birds were aged based on plumage condition and skull development. Pinkish skulls and a rugged molt line indicated a juvenile bird while a grayish skull and neat feathers indicated an adult bird.

Figure 1. Hummingbird

Figure 2. Brown Eyed Junco

Results

We found that more birds in their hatching year had fatally collided with the windows of the C&SS Bldg. The graph below shows how many birds were in their hatching year (HY), after hatching year (AHY), and after second year (ASY). However, a goodness of fit test produced a p-value of 0.08, indicating no significant association between bird age and fatal collisions.



A bird in its hatching year

Side view of a hatchling

Conclusions

We found that, even though a greater number of juvenile birds fatally collided with the windows of the C&SS Bldg., there was no significant association between age group and fatal collisions according to a goodness of fit test.

A p-value of 0.05 would indicate a significant difference for the groups tested. Our p-value of 0.08 may simply reflect our small sample size. We do not yet have a full year of census data to work with.

To investigate further whether bird age affects the likelihood of fatal window collisions, we will need additional census data.

Future Directions

Future studies could focus on why more juvenile birds collided with the windows of the C&SS Bldg. Possible explanations are that there were more juvenile birds in the area at the time of recording; we will determine the hatching times of local birds. Juvenile birds may also have lower visual acuity; further research is needed to investigate this possibility.

We are also currently conducting a 12-month census to obtain a larger sample size so that we can test again for an association between bird age and window collisions.

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Bibliography

1. 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, 116*(1), 8-23. doi:10.1650/condor-13-090.1

2. Hager, Stephen B., et al. "Window Area and Development Drive Spatial Variation in Bird-Window Collisions in an Urban Landscape." PLoS ONE, vol. 8, no. 1, Jan. 2013, pp. 1–10. EBSCOhost,doi:10.1371/journal.pone.0053371

3. Kahle, L. Q., Flannery, M. E., & Dumbacher, J. P. (2016). Bird-Window Collisions at a West-Coast Urban Park Museum: Analyses of Bird Biology and Window Attributes from Golden Gate Park, San Francisco. PLoS ONE, 11(1),