

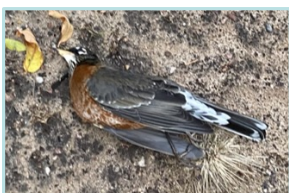
## Flying the unfriendly skies: Assessing building dynamics and window strikes to reduce bird mortalities

### Introduction

- An estimated 1 billion birds die from colliding with buildings in the United States each year (1).
- Some newer buildings on the UWSP campus are designed with large glass panels and another one is being built.
- Are there building features that cause more bird strikes than others? If so, how can this information be used to mitigate bird mortalities (see Fig. 1) from new structures?



Figure 1. Deceased birds resulting from window collisions. Clockwise starting from top left: Ovenbird, CBB, Spring 2022; Golden-crowned kinglet, CBB, Fall 2023; American robin, DUC, Fall 2023; Yellow-rumped warbler, NFAC Spring 2022.



### Methods

- Carcasses surveyed in 2m strip around CBB, TNR, NFAC, DUC, and ALB (Fig. 2).
- Surveyed twice daily for 5-6 weeks; occurred September-October in fall, April-May in spring. Data collected in fall 2021, 2022, 2023 and spring 2022.
- Collected data on species, location, time, temperature, cloud cover, and precipitation.

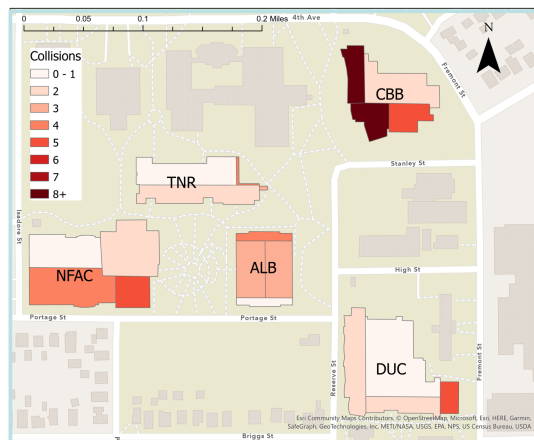


Figure 2. Map of surveyed buildings on UWSP Main Campus with total number of collisions per building zone over study.

### Results

- 65 recorded collisions over 4 survey seasons (Table 1).
- 40% of collisions attributed to CBB.
- Warblers compose 38.5% of recorded collisions; next highest are sparrows at 12.3% (Fig. 3).
- No clear correlation of environmental factors and collision rates.

Table 1. Number of recorded birds of each species per season across study.

Species	Fall	Spring	Total
American Robin	3		3
Black-capped Chickadee	1		1
Brown Creeper	2		2
Cedar Waxwing		1	1
Common Yellowthroat	2	1	3
Dark-eyed Junco	4		4
Falcon sp.	1		1
Gray Catbird	1		1
House Finch		1	1
Kinglet, Golden-crowned	3	1	4
Kinglet, Ruby-crowned		2	2
Mourning Dove	2		2
Ovenbird		4	4
Sparrow sp.	4		4
Sparrow, House	1		1
Sparrow, White-throated	2	1	3
Thrush sp.	1		1
Thrush, Swainson's	1		1
Unidentified	7		7
Warbler sp.	3		3
Warbler, Blue-winged		1	1
Warbler, Nashville		2	2
Warbler, Tennessee	2	1	3
Warbler, Yellow		1	1
Warbler, Yellow-rumped	6	2	8
Yellow-bellied Sapsucker		1	1
Grand Total	46	19	65

### Discussion

- Mitigating future bird collisions on the new Albertson Hall will be important; bird-safe glass and window treatments are effective solutions (2).
- Highest frequency of collisions are in areas where buildings have large windows.
- Neotropical migrants (e.g. warblers) are negatively impacted by habitat fragmentation (3) – window collisions may add to survival pressures.

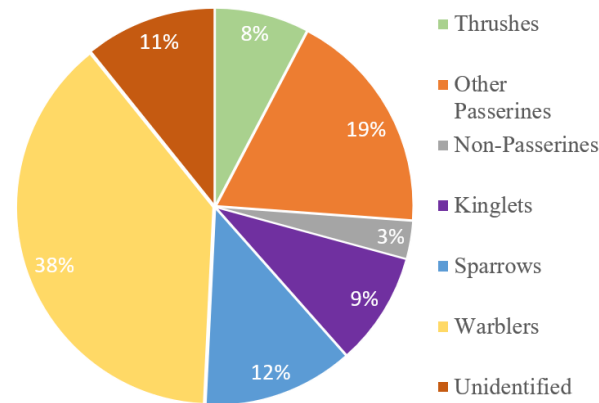


Figure 3. Proportion of bird collisions recorded by bird species groups. Here, "Thrushes" represents members of the family Turdidae, "Non-Passerine" represents falcons and sapsuckers, "Warblers" represents members of family Parulidae, and "Other Passerines" represents all members of order Passeriformes that are not included in another group.

### Acknowledgements

Special thanks to all the survey volunteers that made the project possible. Photos in Fig. 1 courtesy of Yekaterina Veselovsky (robin), Dalton Zingsheim (kinglet), and Spring 2022 volunteers (Ovenbird, Yellow-rumped Warbler).

### References

1. Loss, S.R., T. Will, S.L. Loss, and P.P. Marra. 2014. Bird-building collisions in the United States: Estimates of annual mortality and species vulnerability. *The Condor*, 116(1):8-23.
2. Klem, D. and P. Saenger. 2013. Evaluating the effectiveness of select visual signals to prevent bird-window collisions. *The Wilson Journal of Ornithology*, 125(2):406-411.
3. Hallworth, M.T., et al. 2021. Habitat loss on the breeding grounds is a major contributor to population declines in a long-distance migratory songbird. *Proceedings of the Royal Society B*, 288:20203164.