

A Review of Lights Out Denver and Recommendations for the Future of the Program

Lois Webster Grant Report

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Introduction

Each year, up to 1 billion migratory birds die from collisions with man-made structures (Lowe, 2021). Denver Parks and Recreation (DPR) is looking to reduce that number. In 2014 Denver was designated as one of 21 cities across the United States that was selected by the U.S. Fish and Wildlife Service as an Urban Bird Treaty City. As an Urban Bird Treaty City, the Office of Sustainability for the City and County of Denver, initiated the Lights Out Denver (LOD) campaign aimed at helping local businesses save energy, money, and migratory birds by promoting bird-safe buildings and reducing nighttime lighting

The LOD program aims to increase awareness of migratory bird collisions in the City and County of Denver and to promote practices—such as reducing nighttime lighting—that can help prevent these needless deaths. Lights out programs from across the country have shown that through data collection, legislation, partnerships, and community involvement, we can make Denver a safer place for birds (Sokol, 2022).

Primary Goals of LOD in 2022

- Increase the percentage of routes covered by DPR staff, LOD volunteers, and Denver Zoo staff from 2021
- Collect bird data to support importance of a LOD program and justification for encouraging partnerships and bird conservation efforts
- Initiate contact with businesses to begin the process of making their buildings bird safe
- Increase education events for City of Denver residents to reduce residential bird deaths
- Lobbying of Denver City Council and Colorado State Government for legislative change to darken downtown and increase the amount of bird safe windows

Methods

DPR staff, LOD volunteers, and Denver Zoo staff walk four designated routes in downtown Denver looking for birds that have collided with windows. These routes are walked during the spring and fall migration periods. The number of routes walked are recorded in SignUpGenius, a web-based volunteer management tool. Data including time, day, location, genus, species (if possible), and photos of the birds are recorded in Survey123.

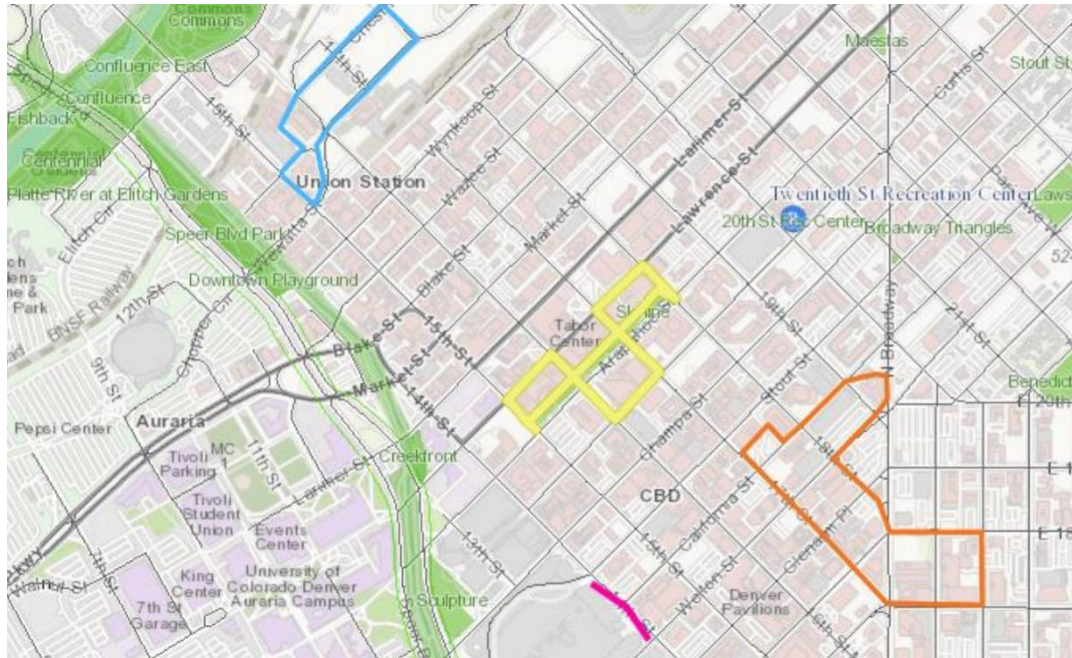


Figure 1. Routes and buildings monitored. Blue - Union Station route with 18 buildings, Yellow – Skyline Park route with 20 buildings, Pink – Convention Center route with 4 buildings, Orange - 17th Street route with 21 buildings.

Dead birds that are in good condition are transported to the Denver Museum of Nature and Science to be catalogued in their collection. Live birds that are stunned are carefully observed. If they can make a recovery on their own, they are left alone or moved to a safe spot where they can recover. If they are too injured to recover on their own, they are transported to Greenwood Wildlife Rehabilitation Center.

In 2022, volunteer recruitment efforts increased, and the volunteer base grew by several members. Assistance from Denver Zoo staff was available in the Fall monitoring season; however, they were not able to walk routes in Spring due to the presence of avian flu in the state of Colorado.

BirdCast data was used to help inform when to have volunteers actively walking routes in the 2022 spring and fall seasons, to make better use of their time. Historically the LOD spring season spanned from the beginning of April to the middle of June and the Fall season from the beginning of August through the end of October. BirdCast shows that the true migration season in the front range of Colorado takes place in a narrower window. This data was used to focus volunteer efforts on true peak migration, to lessen the time commitment for volunteers and increase their impact.



Figure 2. Spring and fall migration peaks are from mid-April to the end of May and mid-August to the end of September.

Contact information for building managers and maintenance teams were obtained from the Downtown Denver Partnership. Messages were sent to these contacts in 2021 and 2022 to inform managers of steps they could take to reduce bird collisions with their buildings. No responses were received by DPR staff. Furthermore, DPR staff have approached secretaries at the front desk of buildings, respectfully requesting contact information for managers that would be responsible for nighttime lighting and window films. Again, no responses have been received. DPR staff have also reached out to window film replacement companies that work on downtown buildings like, A Solar Solution, to help spread the work to building managers that UV reflective window coatings can save birds. They have responded positively and already have UV options for windows.

Four education events were held targeting residential Coloradoans. They included a lunch and learn at the Denver Zoo, a booth at World Migratory Bird Day in Cheesman Park, a booth at a Downtown Denver Partnership event in Downtown Denver, and a booth at the Denver Parks and Recreation Employee Expo. These education opportunities focused on how individuals can reduce bird deaths at residential homes and provided information on how to become a LOD volunteer. A total of approximately 417 attendees were reached at the events.

Finally, DPR staff, in partnership with Audubon, wrote a proclamation making April Lights Out Month in Denver, which was published by Denver City Council. DPR staff suggested May as the Lights Out Month, however Denver City Council changed the month to April to align with Colorado's Lights Out Month of April.

Results

The number of routes and percent of routes walked in 2022 increased significantly from previous years. Data is not available for total routes walked before 2021, but it is estimated that the "Total Routes Walked" was under 20 due to Covid and fewer active volunteers.

Season	Birds Found	Dead Birds	Injured Birds	Days of Observation	Total Available Routes	Total Routes Walked	% of Routes Walked
2019 Fall	22	19	3	12	*	*	*
2020 Spring	16	13	3	14	*	*	*
2020 Fall	8	6	2	7	*	*	*
2021 Spring	13	12	1	31	*	49	*
2021 Fall	29	27	2	25	244	40	16%
2022 Spring	10	10	0	38	220	82	37%
2022 Fall	25	24	1	29	160	93	58%

Table 1. Season totals for birds found and routes walked

A total of 122 birds have been found through 4 years of monitoring. Live data can be explored anytime on LOD's [website](#). LOD monitors a total of 63 buildings, with a select few buildings appearing to be particularly dangerous for migrating birds. Seven buildings are responsible for 53% of window strikes. Five of the buildings are on the 17th street route. The top two buildings, 1700 Lincoln and 1999 N Broadway, are responsible for 26% of window strikes. The Union Station route has recorded only seven dead birds, which is the fewest of any route.

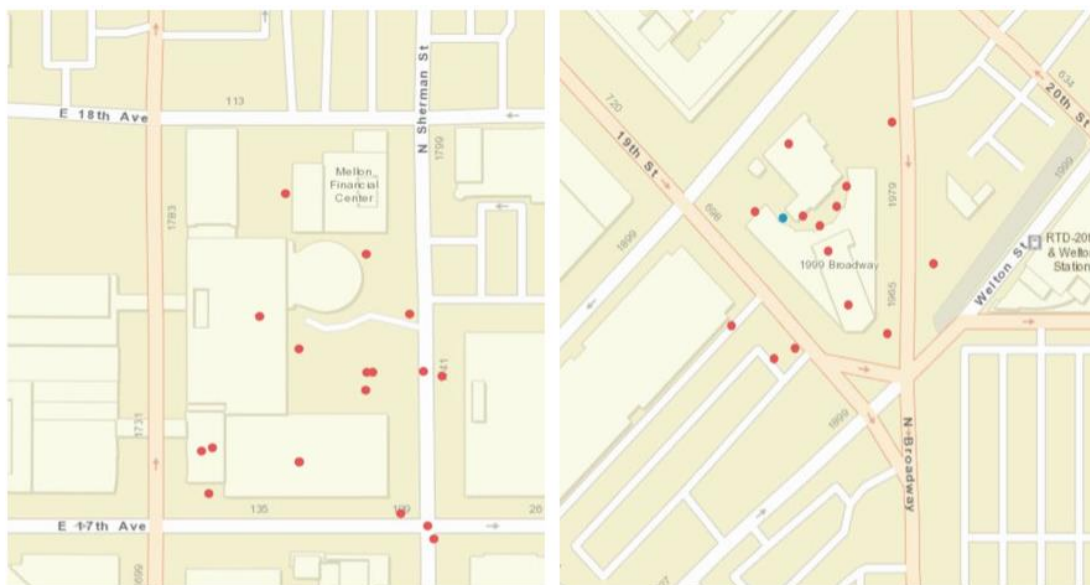


Figure 3. (Left) 1700 Lincoln accounted for 17 window strikes and (right) 1999 N Broadway accounted for 15 window strikes.

LOD staff estimate that there have been 59 species of birds found, but due to the degraded nature of many animals found, species level ID is frequently impossible. Thus, LOD categorizes birds by the most detailed taxonomical ID as is possible which is typically genus.

Types of Birds Found

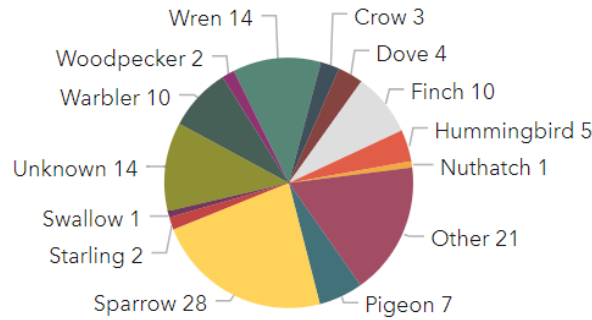


Figure 4. Pie chart of the taxa found by volunteers. The “Other” category includes Vireos, Bluebirds, Grackles, Poorwills, Creepers, Thrashers, Thrush, and other songbirds. The “Unknown” category are birds that are too degraded to ID.

BirdCast is a bird migration forecasting tool, which has data available for Denver County starting in 2021. LOD had eight instances of finding three or more dead birds in 2021 and 2022, all of which were preceded by a night of “high” migration or at least 30,000 migrating birds through Denver County.

Date	BirdCast Forecast Number	BirdCast Forecast Designation	Wind direction
5/2/2021	34,600	High	NNW
9/16/2021	58,400	None	SE
5/1/2022	86,600	High	NNW
8/30/2022	84,300	High	SW
9/13/2022	273,000	High	SSE
9/14/2022	30,100	High	ESE
9/16/2022	181,600	High	S
9/26/2022	75,700	None	SSW

Table 1. Days with three or more dead birds found compared to BirdCast Forecast data from the night before

Most window collisions occur in the early hours of the morning (Lowe, 2021). Also, custodial staff for downtown buildings start cleaning the walkways early in the morning, so LOD volunteers are encouraged to walk routes before dead birds are cleaned up, but for various scheduling reasons many routes are still walked later in the day. The data does reflect that 75% of birds are found before 8:00am.

Time	Count
5:00 AM - 6:00 AM	11
6:00 AM - 7:00 AM	51
7:00 AM - 8:00 AM	29
8:00 AM - 9:00 AM	6
9:00 AM - 10:00 AM	8
10:00 AM - 11:00 AM	7
11:00 AM - 12:00 PM	1
12:00 PM - 1:00 PM	3
1:00 PM - 2:00 PM	3
2:00 PM - 3:00 PM	1

Table 2. Time of day compared to number of dead birds found

Discussion

The LOD team was successful in increasing the number of routes walked by staff due to funding from the Lois Webster Grant and through more recruitment of dedicated volunteers. We still aim to increase participation in the program for 2023 by reaching out to the vast network of Denver Field Ornithologists via our contact with Mike Fernandez.

We were also successful in taking first steps with Denver City Council, with the publishing of the Lights Out Proclamation in April. We will work to develop this relationship and advise the council on how to make data driven decisions that will make it into the Denver Green Codes. Unfortunately, finding good contacts for property management groups remained elusive. We will continue to work with Downtown Denver Partnership to get buildings to retrofit windows and turn off lights during migration season.

The day, time, and number of routes walked is crucial to understanding Downtown Denver's impact on bird fatalities in the central flyway of North America. The heavily populated and ever-growing Front Range communities will inevitably have a much larger impact on birds than the data that LOD collects can reflect. Therefore, LOD must maximize the potential of each route walked and use staff time efficiently to work with building owners and the city and state legislature to make Denver a truly bird safe city. Based on the data collected over the last four

years and the support of Denver Audubon, the current LOD team has several plans to change current practices to increase the efficacy of the program.

Firstly, the buildings with the highest mortality rates should be prioritized for outreach to change their window tint and nighttime lighting behaviors. This includes, 1700 Lincoln St., 1999 N Broadway, 717 17th St., 1701 California St., 1125 17th St., 700 14th St., and 1801 N Broadway. A Solar Solution has worked with several of these buildings in the past, so building a good relationship with them could be the key to retrofitting the windows on these buildings.

The Union Station route has only had seven dead birds found over four years and seems to be the least dangerous area for birds that LOD has monitored. This route will be eliminated in future seasons to focus staff and volunteer time elsewhere. The Skyline Park route only has one high impact building and most of it will be under construction for the next several years. This will make it harder to survey and the impact on birds is likely to change after construction is completed. This route will also be eliminated until construction is complete, at which time LOD will resume walking routes to assess any changes post construction. Time saved from these routes will be rededicated to other parts of downtown that have not been surveyed. Either another route will be created or select buildings will be designated for staff and volunteers to drive/bike to and quickly survey.

Finally, LOD will start promoting “high migration” days as predicted by BirdCast, for priority days that staff and volunteers should walk. Many of the peak migration nights were not followed up with walking routes the following morning. Peak nights in May and September when the highest numbers of birds are passing through will be made morning priorities by DPR staff.

Acknowledgments

Lights Out Denver would not be possible without its dedicated group of volunteers who walk downtown Denver on chilly, dark mornings looking for dead birds. It can be a harrowing experience and we cannot thank them enough for their efforts. We would also like to thank the Denver Audubon Society for their expertise, passion, and financial support of the program. Denver Zoological Foundation provided staff time, insight, and were directly responsible for saving a poorwill which was found stunned on the Skyline Park route. Denver Museum of Nature and Science makes themselves available to process and collect the birds that we find, making collection and preservation a valuable part of our program. Greenwood Rehabilitation Center, Colorado Parks and Wildlife, and Bird Conservancy of the Rockies have all given time and effort to make LOD the program that it is today. Thank you!

Citations

Lowe, J. (2021, May 24). *Birds flying into windows? truths about birds & glass collisions from ABC experts*. American Bird Conservancy. Retrieved November 1, 2022, from <https://abcbirds.org/blog/truth-about-birds-and-glass-collisions/>

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