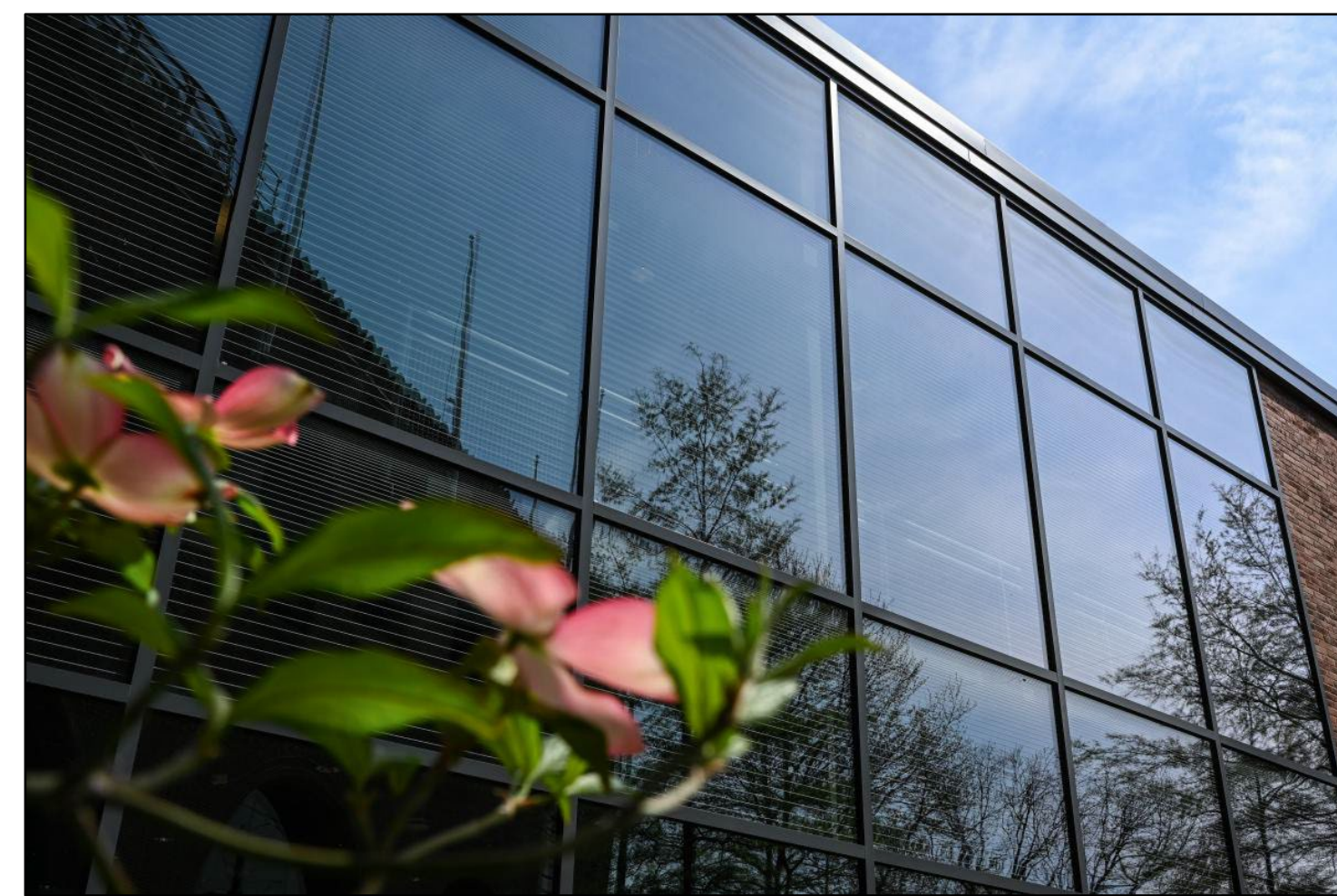


## Overview

Due to light reflection and inability to perceive certain materials such as glass, birds often collide with windows or other structures of the built environment (bird strikes), frequently resulting in distressing and sometimes fatal injuries. The Bird-Friendly Penn project in collaboration with the Penn Sustainability student Eco Reps group seeks to address these issues, pushing for architectural changes as well as enhanced educational resources. To tackle the issue from all sides, from 2023-2024, Bird Friendly Penn focused on increasing educational awareness of Penn's urban biodiversity, continuing to track bird strike data, and increasing research into feasible architectural design guidelines to suggest to the university.



**Figure 1.** Bird-friendly acid-etched glass on Singh Center for Nanotechnology.



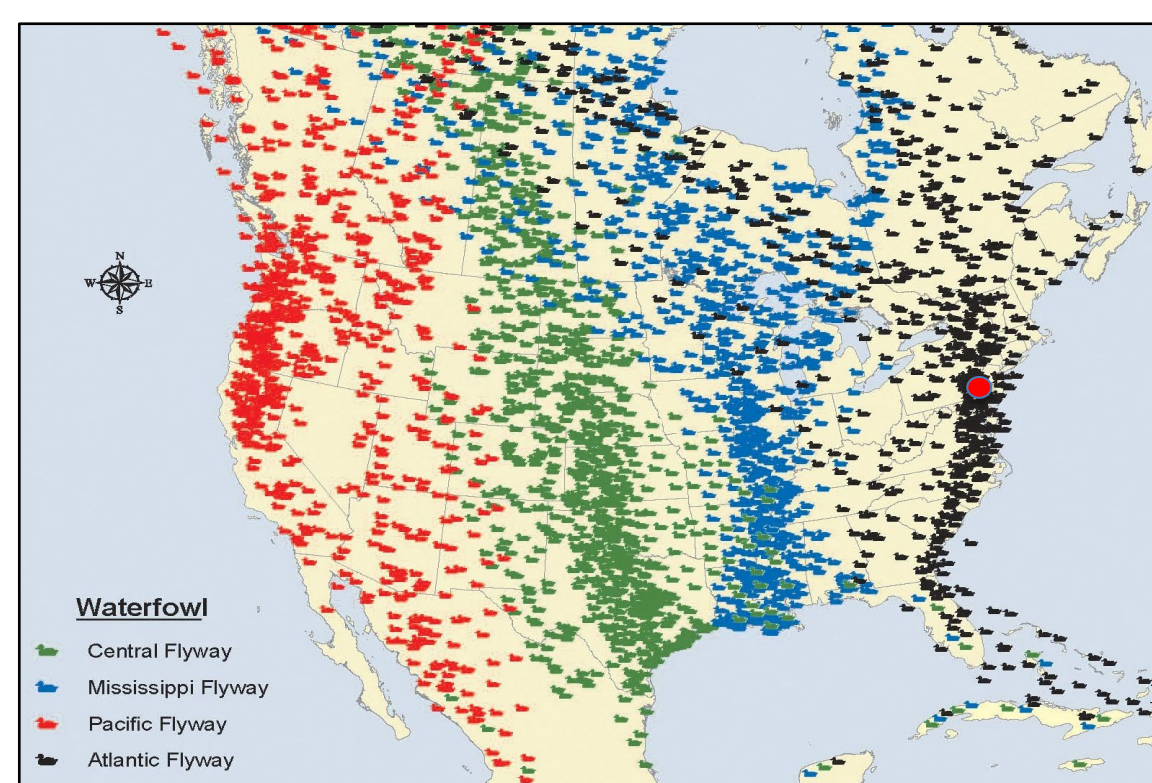
**Figure 2.** Bird-friendly fritting on Ringe Squash Center.

### Preliminary Findings:

- Current retrofitting initiatives successfully decreased bird strike quantities at hot spots
- University pushback due to cost, material availability, aesthetics, building historical valued

## Problem

- Bird populations in North America have fallen by 30% in the last 60 years
- Philadelphia is located in the Atlantic Flyway: migration trajectory for ≥ 500 types of birds

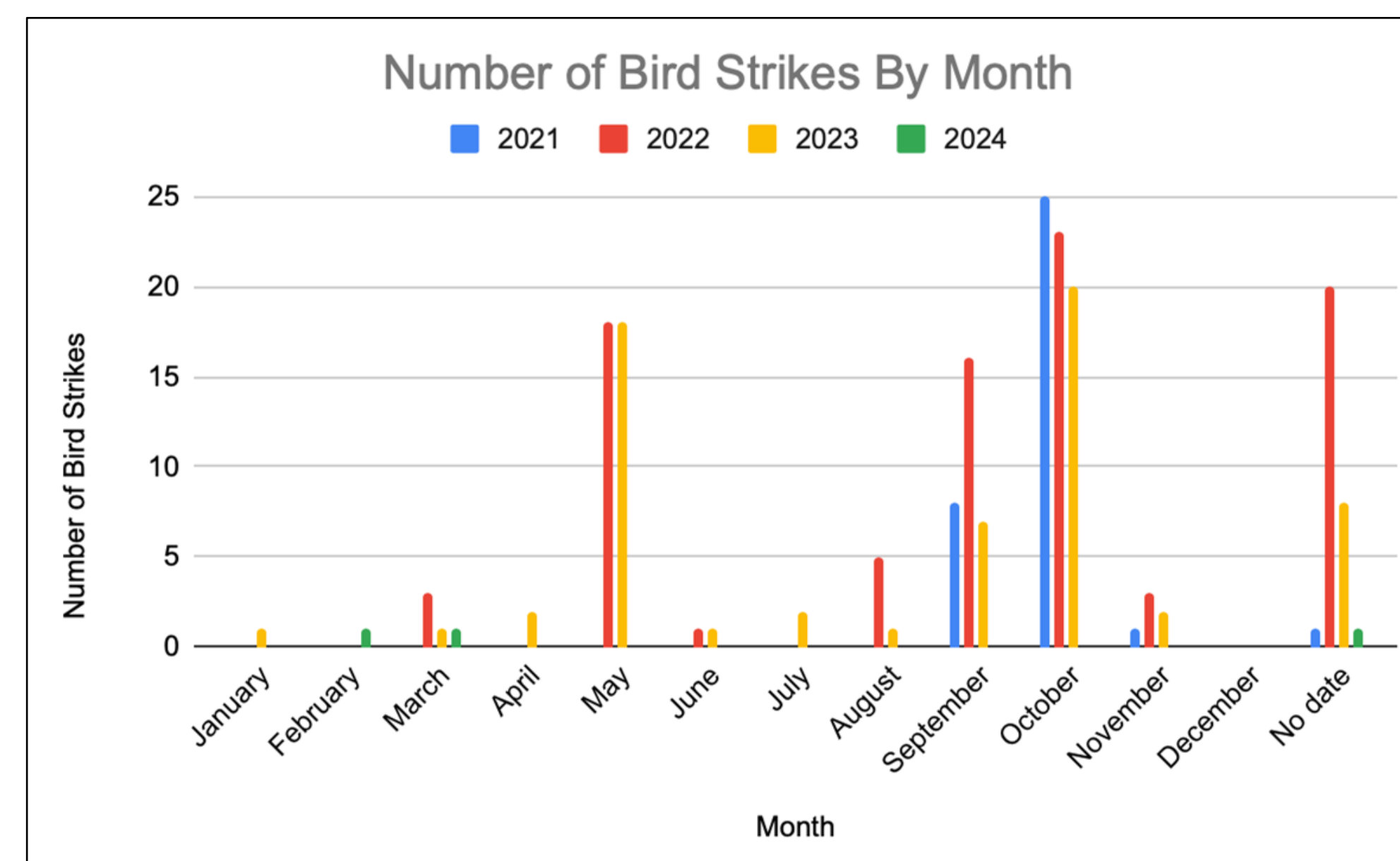


**Figure 3.** Migratory bird trajectories in North America. Atlantic Flyway trajectory is shown in black, clustering through Philadelphia (shown by red dot).

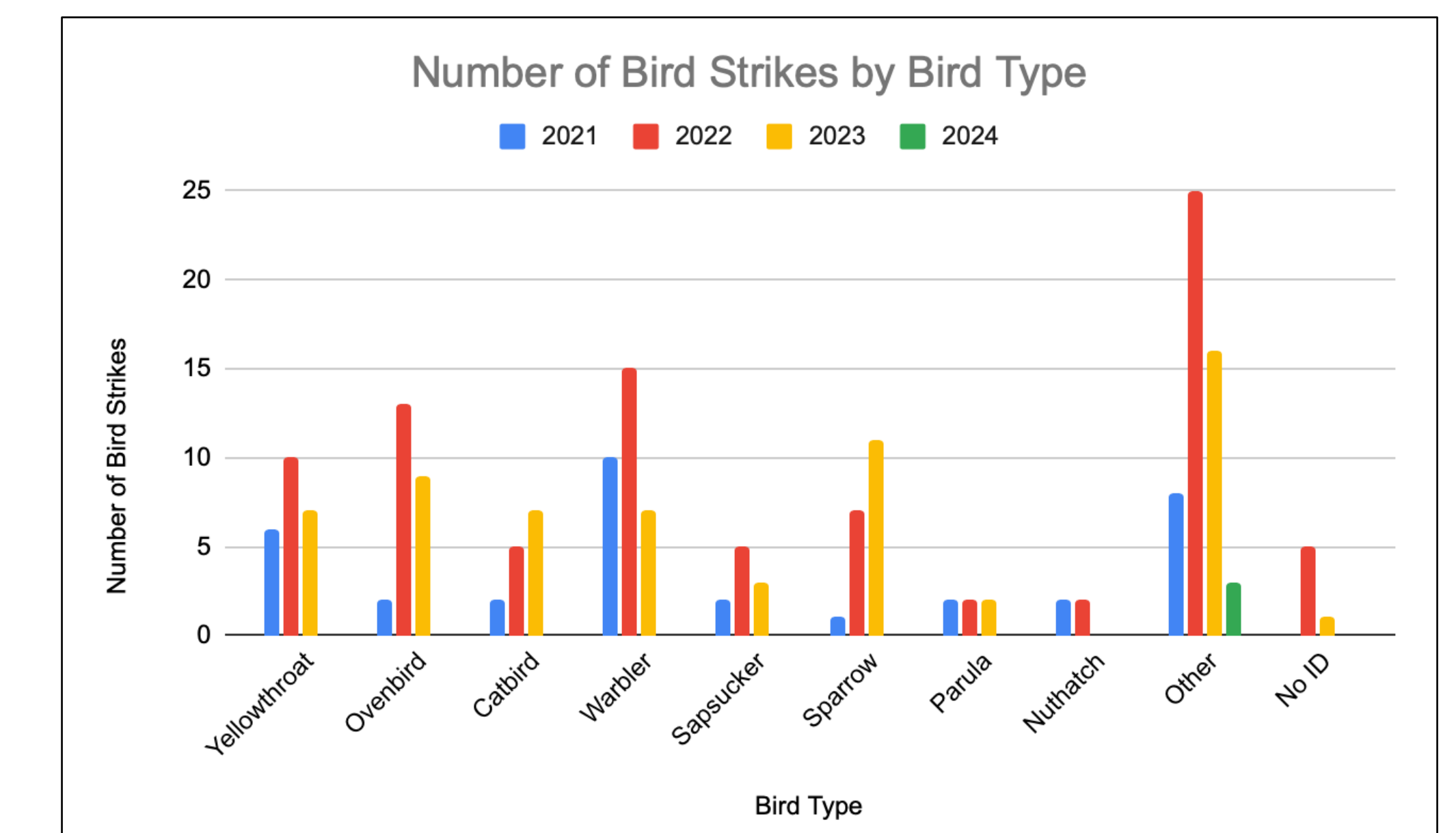
- Birds have difficulty distinguishing reflections from the environment, leading to collisions with buildings (**bird strikes**), especially glass
- Collision hot spots at Penn: Gutmann College House, Lauder College House, Van Pelt Library, Claire Fagin Hall, Hamilton Walk, and Steinberg-Dietrich Hall
- Difficult to implement bird-friendly initiatives because of pushback
  - Reasons: building historical value, aesthetic, cost, and availability of materials
  - Especially difficult for retrofitting initiatives like etching, fritting, and film

## Campus Bird Strike Monitoring

Bird strikes on Penn's campus are logged using iNaturalist, a free online tool that allows users to record and share observations in nature, including bird strikes.

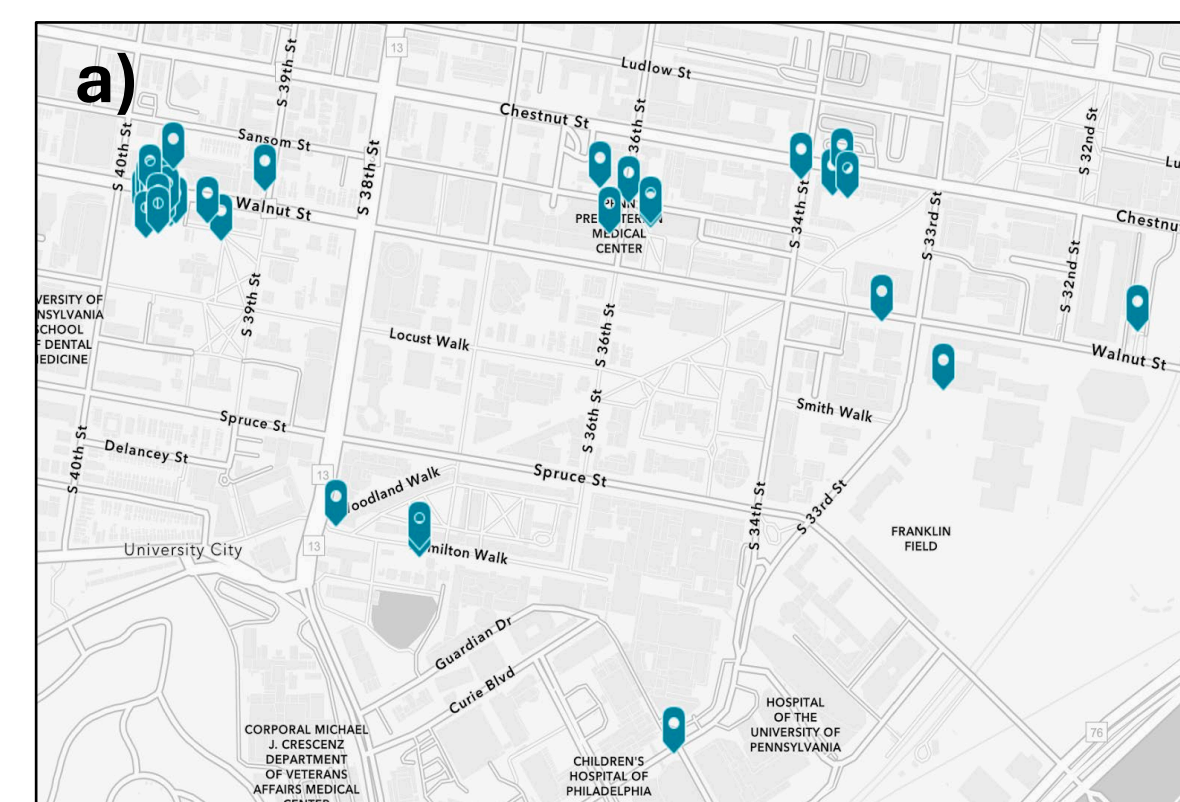


**Figure 4.** Number of bird strikes by month, from Sep. 2021–March 2024. The greatest number of bird strikes occur in **May, September, and October**.

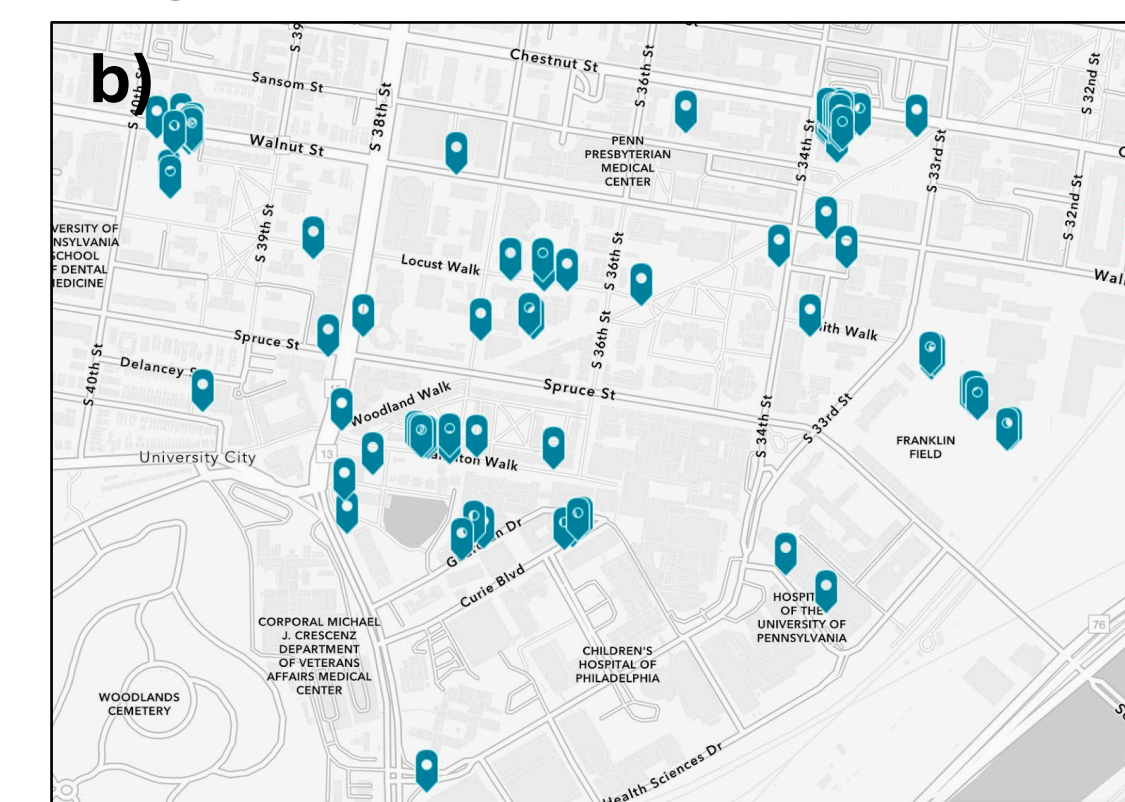


**Figure 5.** Number of bird strikes by bird type for 2021-2024. The greatest number of bird strikes occurred for **warblers, ovenbirds, and sparrows**.

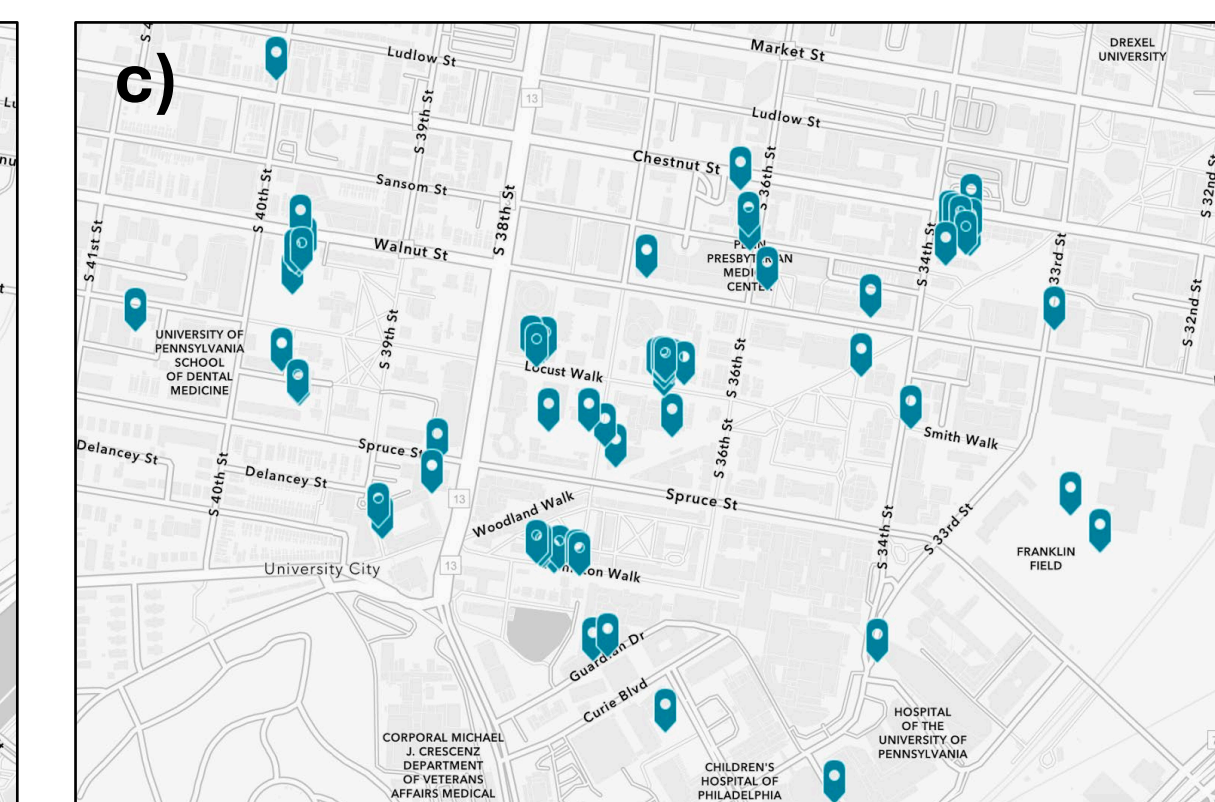
Figures 6a-d. Maps of reported bird strike collisions on Penn's campus by year



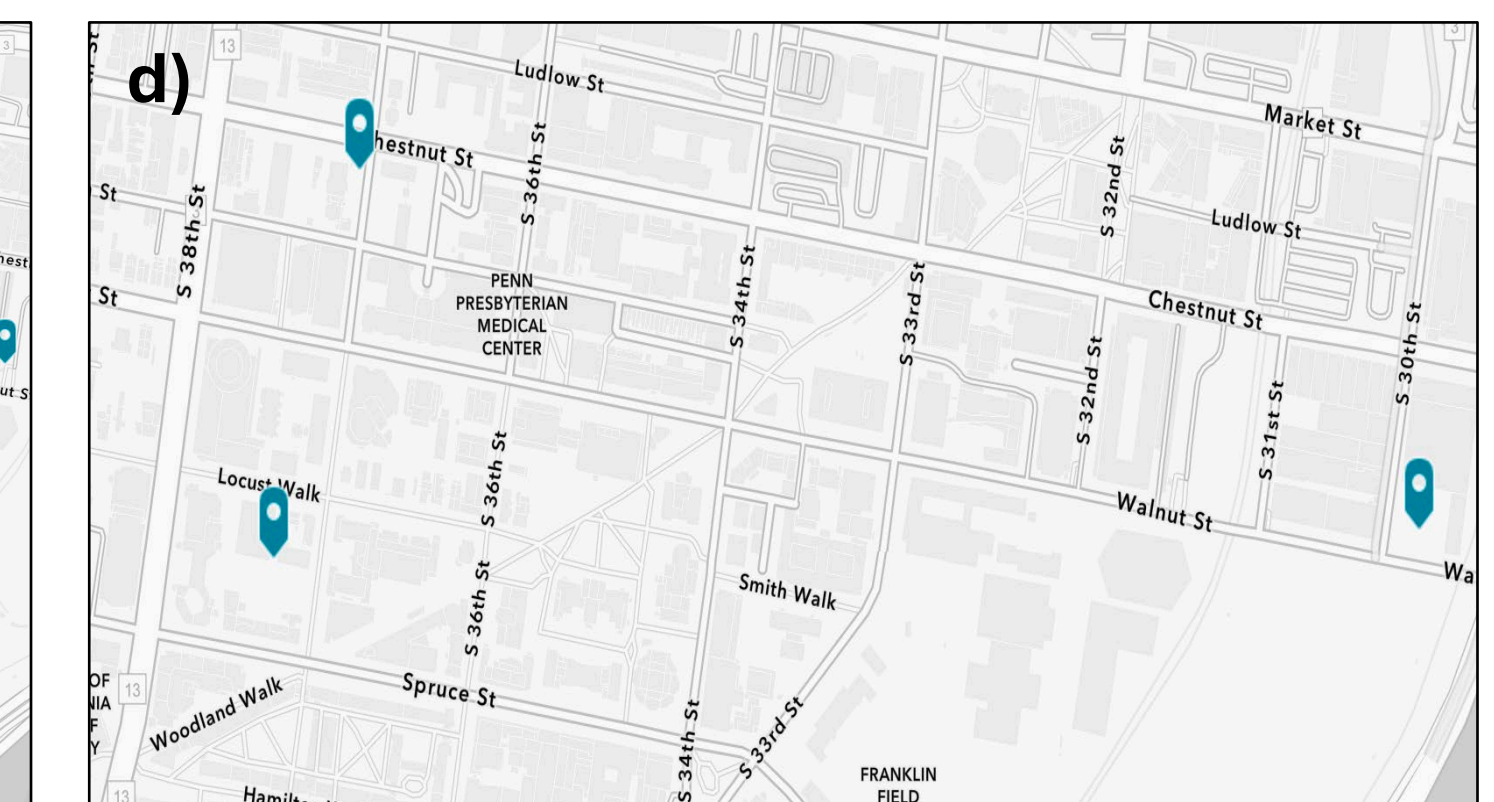
**Figure 6a.** Sep. 2021–Dec. 2021



**Figure 6b.** Jan. 2022–Dec. 2022



**Figure 6c.** Jan. 2023–Dec. 2023



**Figure 6d.** Jan. 2024–Mar. 2024

## Other Efforts

### Educational Outreach

#### Lights Out Night Out

- Hosted an educational event to watch the lights go out over the Philadelphia skyline while learning about bird migration

#### Birding Backpacks Bird Walks

- Used Penn Sustainability birding backpacks while leading a bird- and wildlife-watching tour near the BioPond

**Figure 6.** Lights Out Night Out event advertisement.



**Figure 7.** Penn Sustainability Birding Backpacks.



#### White Paper:

- Researched & wrote a white paper on the bird strike situation at Penn as well as potential solutions to the problem
  - Solution include: fritting, acid etching, *Acopian BirdSavers™* cords, and UV or dotted film

## Conclusion

- The greatest number of strikes occur during bird spring and fall migration season (May, September, and October).
- **Bird strikes seem to show a decreasing trend since 2022, meaning that Penn's bird-friendly initiatives are most likely successful so far!**
  - We don't have enough data to make the definitive conclusion that strikes are declining because we are still missing a lot of data, which is an issue we're trying to overcome by growing our network of partners.
- The most common bird strikes include ovenbirds, warblers, and sparrows, which correlates with the commonality of these birds migrating through Philadelphia.
- According to clustering data, major hot spots for bird strikes are near Gutmann College House, Lauder College House, and Hamilton Walk.

## Acknowledgements

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