

# Glass-walled buildings can mean death for birds, killing 1 to 5 percent of them a year

7 August 2009, By Karen Knee

The front of Temple University's student center is an almost seamless wall of glass, reflecting trees and sky in lifelike detail and adding visual appeal to the urban landscape.

But, for the city's winged residents, the glinting surface can be a killing zone.

The very qualities that people prize in glass -- its transparency and reflectiveness -- make it invisible to birds, who mistake the reflections for reality. They often fly straight into windows, and, according to a study by the New York City Audubon Society, the impact kills them nine times out of 10.

Bird-window mishaps have been overlooked until recently, said Muhlenberg College ornithologist Daniel Klem Jr., who has researched the problem for three decades.

In the last five years, environmental groups, city governments, and schools such as Temple and Swarthmore have begun seeking ways to prevent the crashes.

Still, those efforts are dwarfed by the scale of the problem. In a paper published this spring, Klem estimated that 520 birds crash into windows and die during the four-month fall and spring migratory period each year in an average 10-square-block urban area. In Philadelphia, located along the Atlantic Flyway, that adds up to more than 40,000 bird deaths during the annual migrations.

In an earlier paper, Klem calculated that building crashes cause between 100 million and a billion avian deaths in the United States each year. Even the low estimate is more than the death toll from cats, cell-phone towers, and windmills combined.

Windows kill indiscriminately, Klem noted, as opposed to other threats, such as predators, disease, and starvation, which cull weaker individuals from the flock.

"From a population standpoint, it's a bleeding that doesn't get replaced," he added, estimating that between 1 percent and 5 percent of the total migratory population die in window crashes annually.

At Temple University, assistant superintendent of grounds Glenn Eck suspected that window crashes were behind the dead birds that he and his student employees kept finding in front of certain buildings. He began an informal monitoring program, collecting the carcasses and identifying their species.

Meanwhile, Keith Russell, Audubon Pennsylvania's outreach coordinator, had been reading Klem's papers. He decided to spearhead a formal study of bird-window mishaps in Philadelphia. While researching potential monitoring sites, he connected with Temple's Eck.

With \$10,000 in funding from the Audubon Society's Toyota-sponsored Together Green program -- as well as two years of data and other assistance from Eck -- Russell collaborated with the Philadelphia Zoo and the Academy of Natural Sciences to set up a monitoring program focusing on two areas: Temple University and Center City.

From April 20 through May 30 -- a period corresponding to the height of the spring migration -- volunteers took to the streets just after dawn, following two designated routes, checking carefully in front of 12 Temple and 11 Center City buildings for bird victims, and recording what they saw.

Russell said he was still compiling the spring Center City data. But at Temple, the volunteers found 47 dead birds from 14 common species, including warblers and sparrows.

Although none of the birds that Russell and his volunteers picked up were rare, Klem says endangered songbird species are equally

vulnerable. There are just fewer of them to find.

Eleven of Temple's avian casualties occurred at the student center -- the deadliest building on campus, Russell's study found. The combination of large, mirrored-glass windows and abundant greenery was probably to blame. Russell added that the survey probably underestimated the number, because some dead birds were carried away by scavengers or fell into bushes, where they were difficult to spot.

Temple hopes to repeat the study during the fall [migration](#) between September and November, said Sandra McDade, the university's director of sustainability. She plans to use the results to identify especially hazardous buildings, where changes are most needed. The findings will also be used to make future buildings safer for birds.

Temple has not yet decided what methods it will use to reduce bird-window mishaps, McDade said, adding that she planned to look into different options -- such as applying decals or paint dots to windows, soaping windows during peak migratory periods, and installing screens -- and their cost.

Seen from across the wide, tree-lined lawn that surrounds it, Swarthmore College's science building doesn't look much safer for birds than Temple's student center. But up close, something different emerges -- a pattern of eighth-inch frosted dots spaced a quarter of an inch apart on most panes.

As birds approach this special "fritted" glass, they see the dots as a barrier and turn around, said engineering professor E. Carr Everbach, who was instrumental in getting them installed. The fritted glass added about \$40,000 to the building's cost, he said.

Everbach and his students designed their own bird-window crash monitors and placed them on two fritted and two ordinary windowpanes in the science center's skyway. Digital camcorders shoot continuous footage of the windows. When a motion sensor detects a thump, it alerts the corresponding camera to send the images from the 10 seconds surrounding the impact -- both before and after -- to a computer.

Everbach hoped to use the data from the monitors to better understand how birds perceive windows and what factors make accidents more likely. But even though fritted panes make up only 60 percent of the skyway's windows, there have been very few thumps.

"We've had exactly four bird hits in five years, and as far as we could tell, all of them were on unfritted glass," he said, adding that, with all conventional windows, he would have expected about 200 hits per year on the science building.

Not only was the special glass good for birds, it also saved Swarthmore money.

"People ask me if we really spent \$40,000 on birds, and I say, no, we saved hundreds of thousands of dollars over the life of the building," Everbach said. He explained that science buildings have high cooling costs, even in winter, and that the fritted glass blocks about 60 percent of heat-producing sunlight.

Klem and Everbach are looking for cost-effective ways to make existing buildings safer for birds without replacing all the glass. Everbach and his students are developing a special roller that paints a dotted pattern on the outside surface of windows. And Klem collaborated with CPFilms chemist Tony Port in Martinsville, Va., to create an adhesive bird-proofing window film. The film is patterned with areas that alternately reflect and absorb ultraviolet light, which is visible to birds but invisible to people.

The film works, Klem said. The only problem is convincing CPFilms that there's enough demand to justify mass-producing it.

Klem suspects that one reason bird-window crashes had been ignored for so long was that no easy, practical solutions existed. But that's beginning to change. Audubon Society chapters have launched monitoring programs in New York and Chicago, and, in Toronto, the city government recently released a manual of bird-friendly development guidelines.

Klem sees these projects as a sign that people are finally beginning to take bird-window mishaps more

seriously.

"I hope it'll be a turning point for the better -- for the [birds](#)," he said.

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