How to Reduce Bird Strikes on High-Rises?

Dan Piselli, *FXCollaborative*

In cities across North America, collisions with glass buildings result in up to one billion bird deaths each year. In New York City alone, it's estimated that between 90,000 and 230,000 birds die annually after flying into glazed structures. We asked a CTBUH Expert, "How Can We Reduce Bird Strikes on High-Rises?"

Bird populations in North America have decreased by one-third since 1970, a staggering loss that suggests the very fabric of our ecosystems is unraveling. First published in the journal *Science* and widely reported elsewhere, the disappearance of 2.9 billion birds over the past half-century is a statistic that cannot be ignored. As architects, we often use glass to connect people with nature, but if done wrong, that glass can literally kill the nature we all seek to connect with.

Collisions mostly occur where birds rest and forage, from the ground up to the tree canopy, not the upper stories of tall buildings. Birds do not visually perceive glass as a physical barrier. They assume they can fly to whatever is reflected in, or visible behind the glass. Reflections can make a building or window appear as open sky or nearby trees and vegetation. Transparency fools birds into mistaking interior space as a safe place to fly, especially to interior vegetation. Cities—expanding both vertically and through sprawl—increasingly occupy or interrupt migratory bird routes. Urban sites bordering bodies of water or rivers, parks, green roofs, courtyards, and street-tree corridors provide habitat but also present bird-vulnerable façades. Unlike common urban birds such as pigeons, migratory birds are not familiar with the built environment.

Shaped by science, solutions to the problem that combine aesthetics and performance have been developed. Proven architectural antidotes to bird strikes can be integrated into both new-build projects and retrofitted into existing buildings. Many of the remedies have additional benefits, such as controlling solar heat gain, reducing un-neighborly reflections, or providing privacy.

Glazing Design: Glass can be altered through patterns or coatings that get birds' attention. Birds will fly through perceived open spaces as small as 2 to 4 inches (51 to 102 millimeters) wide, so mitigation measures must be at least that dense. Patterns of many colors or opacities work, giving architects much design freedom. Fritting, sandblasting, acid-etching, lamination, or other strategies can be used. Barely perceptible ultraviolet coatings have been available for some time, and more have recently come to market. Façades that incorporate tightly-spaced solar shading devices, metal mesh, translucent and perforated materials also mitigate collisions.

The 2014 renovation of the Jacob K. Javits Convention Center—which had the reputation as the worst bird-killing building in New York City—involved replacing the original tinted, reflective glass with a less-reflective type that had a frit pattern of tiny dots, reducing bird fatalities by more than 90 percent, while also reducing air conditioning loads and saving energy.

Lighting: Migrating birds are often confused by lighting. Illuminated façades and bright interiors create a "beacon effect" that attracts birds, breaks their flight pattern, and draws them to developed areas. To avoid this, both interior and exterior lighting should be minimal. Avoid up-lighting, especially stray up-light and shafts of light that go up into the sky. On skyscrapers that must comply with aviation or marine-safety regulations, minimum-intensity strobe lighting with a three-second flash interval is recommended instead of continuous lighting. Perimeter lighting, wall-washers, and floodlights should be used judiciously, with minimum-wattage lamps and full cut-off configurations. Inside, automatic timers can be set to dim or turn off lights at night.

Regulation and Advocacy: Bird-friendly building requirements have been enacted in Toronto, San Francisco, and elsewhere. In 2019, the New York State legislature established a Bird-Friendly Building Council to research the issue and develop a set of recommendations for potential state law. The New York City Council is considering local bird-friendly building mandates.

Through educating owners and operators on the strategies of bird-safe building design, we can contribute to the quality—and the continuity—of life in our cities in ways that are cost-effective and environmentally sound. As a primer, the American Bird Conservatory and New York City Audubon Society have produced a useful resource, "Bird-Friendly Building Design" (collisions.abcbirds.org). ■

About the Author

Dan Piselli is Director of Sustainability at FXCollaborative. Named a Senior Associate in 2015, he joined the firm in 2005 and has over 19 years of experience. He is an industry leader on bird-friendly building design and is a board member of the Bird-Safe Glass Foundation.

Editor's Note:

On 10 December 2019, New York City Council passed a new policy that requires new buildings meet bird-friendly standards. The policy also covers major renovations that include modifying existing glass.