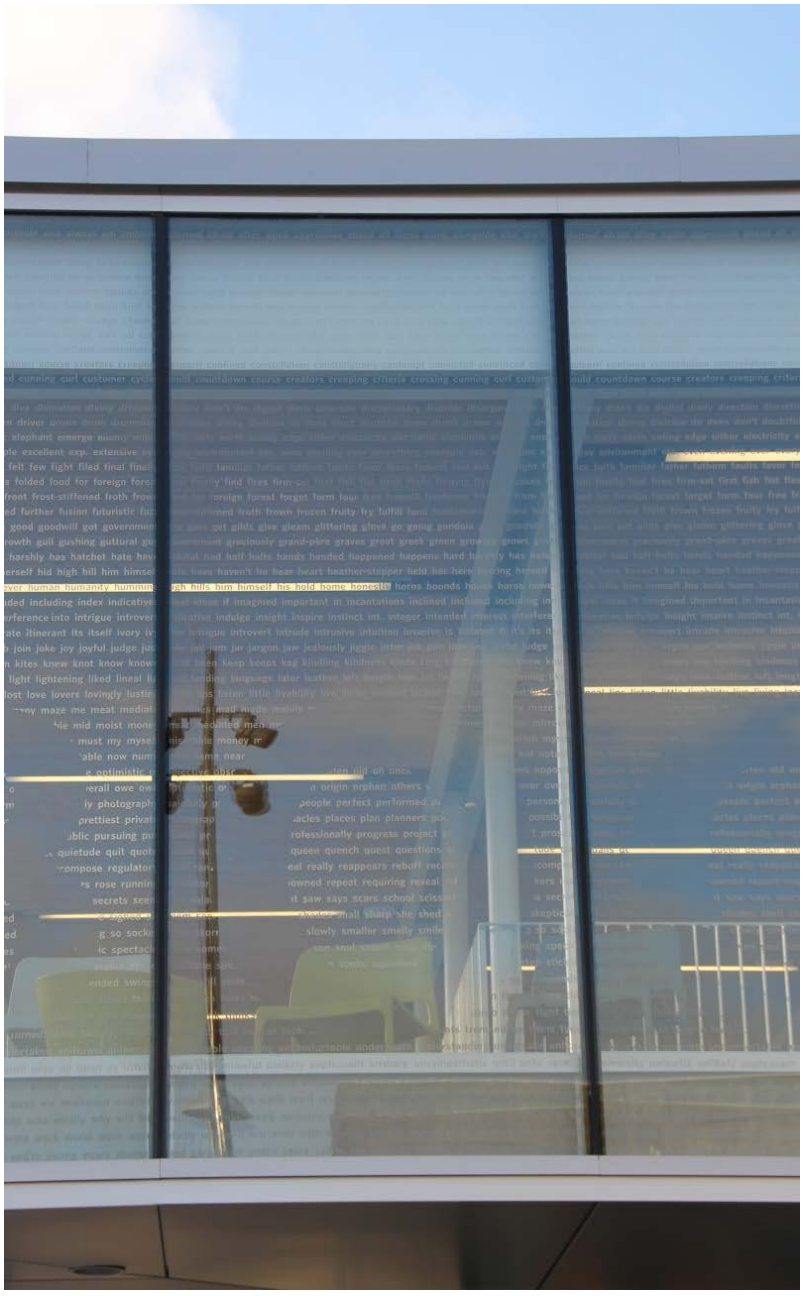
The University of British Columbia

Bird Friendly Design Guidelines for Buildings




Golden crowned Kinglet is the most common bird to collide with buildings at UBC

What is the goal of this document?

To raise awareness about the dangers buildings pose to birds and inspire the incorporation of bird-friendly design strategies in campus development. Designing or retrofitting a structure to be bird-friendly does not need to add to construction costs, nor does it need to restrict the imagination. As such, innovative thinking is encouraged when it comes to the application of the guidelines contained herein.

Why are birds important?

As institutional and educational leaders in regenerative sustainability, the design of our built environment should benefit biodiversity on campus and beyond. Birds are particularly important because they provide essential ecosystem services in the form of pest control, pollination, and seed dispersal. In addition to this, the high visibility and audibility of birds creates a valuable experiential link between people and local wildlife in urban settings.

How are we endangering birds?

Glass is currently one of the largest sources of anthropogenic bird mortality in North America. Birds are unable to perceive glass as a solid object and building collisions occur when they try to fly into the sky or vegetation they see through or reflected by glass. If glass is sensitively incorporated into the built environment, these pitfalls can be avoided and we can continue to enjoy the benefits this material offers.


UBCO Reichwald Health Science Centre film was retrofitted to glass panels

How widespread is the issue?

When building collisions do occur, death is not always instantaneous and may occur as a result of internal hemorrhage days after impact, far away from the original collision site. This fact, paired with the rapidness of scavengers, makes accurately monitoring the problem difficult. In Canada, it is estimated that 16 to 42 million birds die annually as a result of building collisions (Machtans et al. 2013). At the University of British Columbia, a recent study looked into how these numbers translate to the Point Grey campus. The study involved monitoring a stratified random sample of 8 buildings in both the Winter and Fall. Based on the number of collisions detected at each building over the course of the survey, the researchers estimated that a total of 45 building collisions occur per day campus-wide in the Winter and 72 in the Fall. The number of building collisions in the Fall is surmised to be higher than in the winter because migratory birds join resident birds on campus at this time, increasing the overall population.

Which birds are the most susceptible?

Healthy, breeding adults are just as likely as weaker birds to collide with buildings which means glass can have a serious impact on bird populations. While there is little distinction among the birds that fall victim to glass, migratory birds face a greater risk than resident birds because they are not as well-adapted to urban life. Since the Point Grey campus is located adjacent to the Fraser River Estuary, a major stop along the Pacific Flyway, migratory birds are a primary concern. Every year, at least a billion migratory birds traverse this route on their way from Alaska to Patagonia.

What can we do?

The predominance of this problem and the need for change is evidenced by major Canadian cities like Vancouver, Toronto, Calgary and San Francisco publishing their own bird-friendly guidelines as well as green rating systems like LEED launching bird-friendly design pilot credits. At the University of British Columbia, we can contribute to this movement by raising local awareness about the dangers buildings pose to birds and adopting the following bird-friendly design guidelines for future development and retrofit considerations.

Screens at the UBC Biodiversity Centre

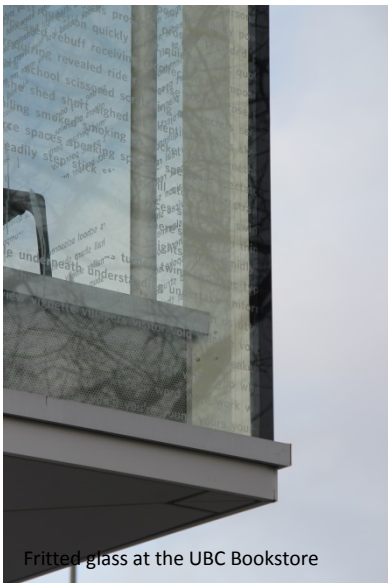
Bird-Friendly Design Strategies

The following guidelines present design strategies developed to make new and existing buildings at the University of British Columbia more bird-friendly. Designing or retrofitting a structure to be bird-friendly does not need to add to construction costs, nor does it need to restrict the imagination. As such, innovative thinking is encouraged when it comes to the application of these guidelines.

Strategy 1: Glazing Design Considerations

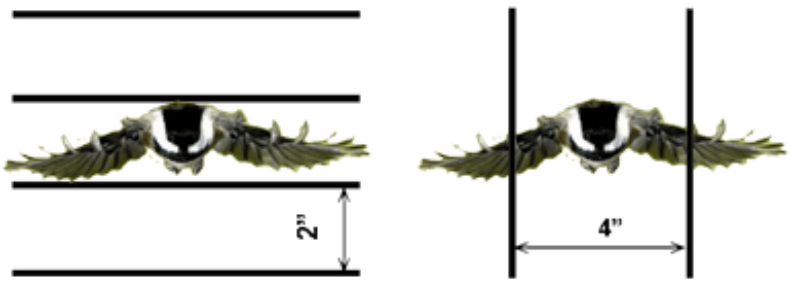
Building collisions occur because birds are unable to perceive glass as a solid object. Strategies to prevent glass collisions include:

- Minimize the quantity of glass.
- Increase the visibility of glass and dampen reflections to reduce the appearance of clear passage to sky or vegetation. Apply visual markers to glass surfaces in the critical zone. The critical zone, which presents the highest collision probability, is up to the fourth floor of a building or mature tree height, whichever is greater. Visual markers should be located on the exterior surfaces of glass and be high in contrast. They should also be based on the 2x4 rule in which gaps are no more than 50mm wide and 100 mm high. Possible strategies include fenestration patterns, adhesives, etching, fritting, sunshades, louvres, screens, blinds, and netting.
- Avoid interior vegetation near windows.
- Pay special attention to glass located adjacent to vegetated areas, green roofs and raised courtyards as well as glass handrails, glazed corners, and configurations in which vertical glass surfaces are located perpendicular to one another.



Fritted glass at the UBC Bookstore

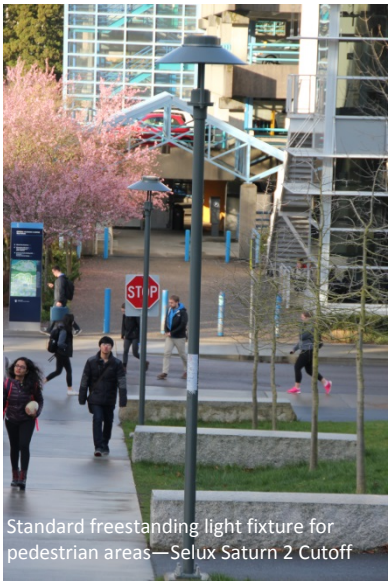
2x4 (50mm x100mm)
Rule Source: FLAP



Strategy 2: Bird Trap Reduction

Birds can become trapped in enclosed spaces and courtyards after colliding with buildings as well as while exploring potential nesting sites. Strategies to avoid bird traps include:

- Secure enclosed spaces with small openings, such as mechanical ducts, with screens to ensure birds are unable to enter.
- Ensure enclosed spaces with large openings, such as courtyards, are generous enough for birds to engage in flight and escape. This dimension will vary depending on the bird species being investigated.



Standard freestanding light fixture for pedestrian areas—Selux Saturn 2 Cutoff

Strategy 3: Light Pollution Reduction

Light pollution attracts and disorients migratory birds at night and subsequently leads to an increased number of building collisions during the day. In addition to increasing bird mortality rates, overly-lit buildings waste electricity. Since institutional buildings at the University of British Columbia must achieve LEED Gold, addressing these issues presents the opportunity to fulfill the light pollution reduction credit. Strategies to reduce light pollution include:

- Use minimum wattage fixtures.
- Reduce light pollution from interior lights by switching off lights or drawing the blinds.
- Install motion-sensitive lighting in lobbies, walkways, and corridors.
- Implement a program to turn off all unnecessary lights after hours or install an operational system to automatically turn lights off. If the building will frequently be used after hours, use the same measure to ensure lighting levels are appropriately adjusted during all nighttime hours.
- Reduce light pollution from exterior lights.
- Reduce spill light through targeted lighting and shielding. Down lighting is preferred, while up lighting and vanity lighting should be avoided.
- Use green or blue light before white and red light.

Citations

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