



Highly reflective glass at the BC Archives Building, Victoria, BC. photo: K. De Groot



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# COLLISIONS WITH GLASS: MILLIONS OF PREVENTABLE DEATHS

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As the world becomes increasingly urbanized, habitat loss and degradation are compounded by a range of hazards that cause direct mortality to birds. One such hazard is glass, yet glass is becoming ever more pervasive in our environment. This is occurring despite our efforts to communicate that the material is responsible for the deaths of an estimated 16 to 42 million birds per year in Canada [1] and up to almost a billion (365 – 988 million) birds in the U.S. alone [2]. Homes in Canada account for a vast majority of collision deaths (90%) [1]. Therefore, the one or more birds killed at individual homes every year adds up to millions across the country.

Many people are convinced that mortalities do not occur at their own homes. However, an unknown percentage of birds that collide and fly away unnoticed will later succumb to their injuries, which often involves internal bleeding [3]. In addition, scavengers





such as crows, gulls, squirrels and outdoor cats quickly remove carcasses of stunned or dead birds [4], and small and cryptically-coloured birds, like sparrows, disappear into our landscaping, grass and leaf litter [5].

Glass poses a hazard to birds for two main reasons. The first is that the reflective properties of glass create mirror images of the natural environment, and birds mistake these visual extensions of sky or vegetation for the real thing [6]. Secondly, transparent glass, as used in two sides of a lobby, in glass railing systems and glass overpasses, creates an invisible barrier in the middle of flight paths and between habitat patches [6].

Even birds that breed in less urbanized areas of North America, such as the boreal forest, spend a portion of their life cycle navigating the hazards of human development. Collision rates are typically highest during the migratory periods when large numbers of birds stop to rest and refuel in our cities [7,8]. However, the heavily developed low elevation areas of southwest British Columbia hosts high densities of overwintering terrestrial birds such as thrushes, sparrows, and finches.

A recent study conducted by Environment and Climate Change Canada at the University of British Columbia (UBC) found that collision mortality rates are high throughout fall migration, winter, and spring migration, representing an extended period over which deaths accumulate [9]. We estimated 281 - 486 birds were killed at just 8 of the 236 similarly sized buildings at UBC across the 225 days monitored for collisions [9]. Cumulative mortality at this campus may be in the thousands annually. We also found that Varied Thrush and Spotted Towhees are particularly vulnerable to collisions in winter. Both species had not been previously identified in the published literature as colliding more frequently

A Song Sparrow, Golden-crowned Kinglet and two Varied Thrushes (male foreground, female background). Four of hundreds of birds killed at UBC. photos: K. De Groot



than expected, relative to their abundance [9].

Preventing bird deaths due to collisions with buildings is both simple and inexpensive. Effective solutions translate the science on bird vision to convince birds that glass is a barrier that must be avoided. For most species of birds, their high-resolution vision is in their lateral fields of view and not in the direction of travel [10]. For this reason, markers on windows need to contrast strongly with reflections in glass to be visible to birds from a distance and be present in high enough density so that birds do not try to fly through the gaps between markers. Therefore, a single decal or other visible barriers on a window is insufficient to prevent deaths.

For more information on how to treat your glass surfaces to prevent bird window collisions, visit [VARC's website](#).



Above: Glass railings and other transparent glass present invisible and fatal barriers for birds. photo: A. Huang

Below: A few of the treatment options in action.



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