

# **SHEET GLASS: AN INVISIBLE AND LETHAL HAZARD FOR BIRDS**

## **Making Our Homes and Workplaces Safe for Birds**

### **THE ISSUE**

Clear and reflective sheet glass as window panes in homes or entire walls of multistory commercial buildings is a passive invisible killer of wild birds worldwide. Among the dead are the abundant as well as the rare, threatened, and endangered species. Investigators have gathered extensive evidence documenting sheet glass as a growing source of avian mortality, and a suspected contributor to overall bird population declines. Preventing these unintended fatalities will require education addressing preventive techniques, regulation addressing the installation of glass in buildings, and enforcement of existing legislation to protect wild birds as an aesthetic and environmentally valuable natural resource.

### **POLICY ISSUES**

- Sheet glass is a proven killer of wild birds, but its attrition on specific species or its part in explaining the decrease in bird populations in general is in need of further study.
- Education programs are needed to inform the general public, the government and non-profit conservation community, and the building industry, to include glass manufacturers, architects, developers, and landscape planners. Current evidence indicates that with the exception of habitat destruction, the lethal toll attributable to sheet glass is equal to or may be greater than any other human-related avian mortality factor.
- Individual birds that are killed striking glass, from a few to hundreds at any one site, go unnoticed or are ignored at countless residential and commercial buildings the world over. Regulation requiring the incorporation of preventive measures in existing, remodeled, or new buildings will save millions of lives while preserving our birds as a unique natural resource. In the U.S., under the Endangered Species Act and the Migratory Bird Treaty Act, the enforcement of protection at buildings where birds are predictably and repeatedly killed will aid in initiating preventive measures. Minimally, regulations are recommended to require warning labels be attached to sheet glass to alert building industry professionals that this product is a proven lethal hazard for birds.

### **BACKGROUND**

Window glass has enriched man's aesthetic, cultural, physiological, and psychological well-being for at least 16 centuries. Extensive observations and experimental evidence supports the interpretation that birds simply do not see clear or reflective glass as a barrier. Consequently, sheet glass as a source of bird mortality is predicted to have increased as the size and clarity of panes have increased with time.

### **THE FACTS**

The dead and dying victims of glass are most often hidden from view in vegetation surrounding human dwellings. They are either killed outright, injured and struggling to recover, or quickly taken by predators and scavengers. Lethal collisions are possible wherever birds and glass mutually occur. Glass casualties have been recorded the world over at panes of all sizes in residential homes and single or multistory buildings. Fatal or injurious collisions occur when flying birds attempt to reach habitat visible on the other side of clear panes, or by attempting to reach illusions of habitat and sky reflected in the glass surface. Intensive studies at single homes reveal one out of every two strikes results in a fatality. Glass is an indiscriminate killer that takes the fit as well as the unfit of a species population. Attrition at glass is an additive rather than a compensatory avian population mortality factor.

Researchers differ in their evaluations of the magnitude of the toll that glass exacts on individual species and bird populations overall. Before much was known, annual deaths attributable to windows were hypothesized to be 3.5 million in the 1970s. Since then, extensive studies over the past three decades have been used to estimate the annual toll to be between 97 million to 975 million birds in the U.S. alone. The wide-ranging difference among these figures attests to the complexity of attempting to determine accurate amounts from a source in which every individual bird is a potential victim and sheet glass of every size is a potential killing site in the environment. The roughly 100 million to 1 billion toll is based on the assumption that 1-10 birds are killed at one building in the U.S. each year. Another independent study produced similar results, and evaluated this current range of annual mortality figures to be reasonable. This confirming study examined records of 5,500 volunteers who optionally recorded bird strikes at windows while they counted visitors to feeding stations at their homes. To put these numbers in perspective, annual U.S. bird populations are estimated to be 20 billion in the fall, and annual glass kills are estimated to be 0.5 to 5.0% of this figure. By comparison, each year U.S. hunters are

estimated to take 120.5 million birds, and free-ranging domestic cats are suspected to kill hundreds of millions to over a billion songbirds. Some researchers suggest that the overall avian mortality attributable to glass is likely to be much greater than what is attributable to cats: reasoning that cats are active predators that most often capture vulnerable prey while sheet glass is an indiscriminate killer that takes the strong as well as the weak and is astronomically more numerous than cats. Minimally, from an ethical and moral perspective, any unintended and unnatural killing associated with human presence in the environment should be addressed and reduced if not eliminated. Guilt and anxiety are common feelings among an increasing number of people who discover an accidental fatality beneath the window of their home, workplace, or any other structure.

Approximately 25% or 225 species of birds in the United States and Canada have been documented striking windows. The species not recorded as window-kills are those that typically do not occur near human dwellings. The sex, age, or resident status of a bird in any locale has little influence on their vulnerability to windows. There is no season or time of day, and almost no weather conditions during which birds elude glass. Transparent or reflective panes of various colors are equally lethal to birds. Strikes occur at sheet glass of various sizes, heights, and orientation in urban, suburban, and rural environments, but birds are more vulnerable to large (>2 m<sup>2</sup>) panes near ground level and at heights above 3 m in suburban and rural areas. Strikes are more frequent during winter when birds are attracted to feeders in larger numbers than at any other time of the year, including the spring and fall migratory periods when glass casualties typically attracts the most human attention because they are often more visible on sidewalks or around workplaces.

Currently, there are many solutions that effectively reduce or eliminate bird strikes, but none that is universally applicable or readily acceptable for all human structures. Protective measures range from physical barriers that keep birds from striking to deterrents that protect by transforming the area occupied by glass into uninviting space or a recognizable obstacle to be avoided. The manufacture of new varieties of sheet glass is recommended: panes having external patterns that alert birds to its presence but retain the current unaltered view from inside. Placement of bird feeders within one meter of the glass surface eliminates the hazard for visitors to these attractants.

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