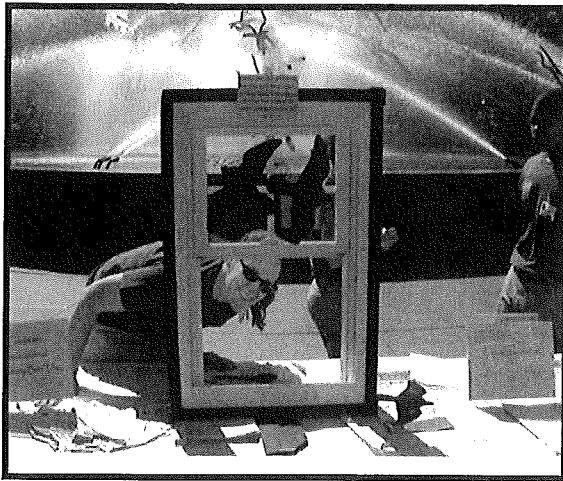


Bird Window-Collision Monitoring at the Philadelphia Zoo: Setting Up an AAZK Citizen Science Project

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Scientists estimate that over a billion wild birds are killed each year across the globe from colliding with man-made structures. Sheet glass gives the illusion of a corridor or deceptively reflects the surrounding landscape. High rise buildings, wind turbines, overhead power lines and radio towers are particularly hazardous to night migrants due to confusing lights on the structures that lead to exhaustion and/or fatal collisions. For the purposes of this paper, we will be focusing specifically on sheet glass collisions, and how we are working to change the odds against wild birds on the Philadelphia Zoo grounds. Through extensive 30-year research, Muhlenberg College professor Dan Klem found that one in every two window strikes are fatal. With this being said, he has taken great strides in encouraging the development of solutions and raising public awareness on the subject (2006). Zoos and aquariums are leaders in the conservation community and have the resources to empower the public to continue this initiative. The Greater Philadelphia Chapter of AAZK has most



Author Wendy Lenhart at AAZK/Education Department table to educate guests on how to prevent bird window collisions at home.

(Photo by Catherine Vine)

recently started a citizen science project with just this in mind.

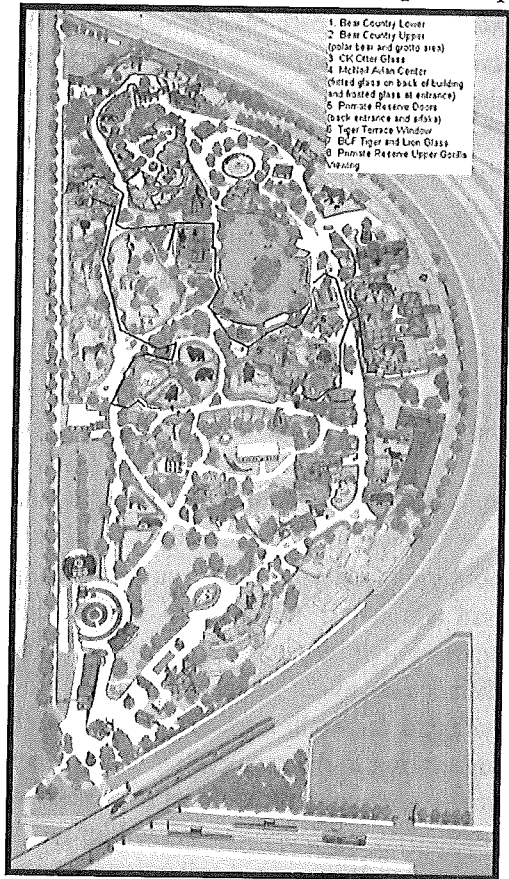
Large panes of glass are commonly employed as architectural components, from private homes to commercial buildings. Zoos also commonly use them for their aesthetic and interpretive appeal so that visitors can appreciate and connect with the animal species on exhibit for greater conservation awareness. Unfortunately, classic glassed-in exhibit designs - ironically inside conservation institutions - can also be areas where wild birds strike the glass. Staff at the Philadelphia Zoo has worked to change that in recent years. Starting in 2006, pathology records were kept of birds that appeared to have fatally struck specific exhibit glass. Around the same time, the Greater Philadelphia Chapter of the American Association

of Zoo Keepers started to collaborate with the Philadelphia Zoo's education department to educate guests on ways they can prevent window collisions at home. Most recently, volunteers from the Greater Philadelphia Chapter of the American Association of Zoo Keepers took this initiative one step further by monitoring the known collision "hot spots" in the Philadelphia Zoo in the mornings during the spring and fall 2010 courtship/migratory seasons.

The Greater Philadelphia Chapter AAZK Conservation Committee oversaw all of the logistics of the 2010 collision study. Volunteers were recruited to either take one day a week to come in early, or serve as a scheduled alternate between the months of April and May for the spring migratory season and between August and October for the fall migratory season. Most keepers at the Philadelphia Zoo start at 0815hrs, so monitors generally came in around 0730hrs. (It is important to note, however that docents, education staff and volunteers also eagerly donated their time for the study.) A tote bag with a mapped route connecting the exhibit "hot spots" to be checked, labeled baggies for dead birds and data sheets were left at the starting location and picked-up by the assigned monitor each morning.

The participant recorded the current weather conditions and attempted to walk the “hot spot” loop three times each morning. When a dead bird was found, the location code for the exhibit, time of day, and the condition of the bird (warm, cold, stiff or live injured) was recorded. Live injured birds were immediately taken to the Animal Health Center and dead ones were brought to the animal necropsy refrigerator per the usual Zoo protocol.

Throughout the monitoring process, communication played a key role. All participants and people willing to serve as alternates were on an email list and a calendar with assigned shifts was posted on the AAZK bulletin board. Some minor changes had to be made on the forms as the study progressed. Thanks to volunteer feedback, an umbrella was also placed in the tote bag for unexpected bad weather. Lead keepers of the buildings with “hot spot” exhibits were notified and asked for feedback and suggestions at the beginning of the monitoring. The grounds department was also notified to be as specific as possible about the locations of dead birds they picked up throughout their daily shifts. Staff on radio at the Zoo called designated keepers in the bird department to pick up collision victims when possible. The veterinary department was invaluable in reporting the results of wild bird necropsies where the cause of death was likely due to a collision. Finally, the Philadelphia Zoo is partnered with Pennsylvania Audubon in monitoring bird strikes around the high rises in Center City Philadelphia during both the spring and fall migration periods. The timing of the Philadelphia AAZK monitoring study as a whole was congruent with the dates of this monitoring so we could contribute to the larger data set. Philadelphia is a major urban sanctuary for birds migrating in the Atlantic flyway, so this partnership was essential.



Map of the Philadelphia Zoological Garden with loop walked each morning between collision “hot spots”

(Courtesy of Philadelphia Zoological Garden)



Bamboo and surrounding landscaping reflected on an exhibit door

(Photo by Wendy Lenhart)

The greatest number of strike reports on Zoo grounds came from the veterinary department’s records of daytime strikes, but monitors also detected early morning collisions throughout the study period. Exhibits with glass that gave the false impression of a corridor had the most fatalities. One known instance of a reflective glass fatality was recorded as well. In this case, for a short period of the morning between 0900 and 0945hrs, the bamboo landscaping was clearly reflected in the glass door of an annex building. It may be feasible in the future to just cover this glass for that period of time during key migration times. The strike victim was a northern waterthrush (*Seiurus noveboracensis*), a migrant that is known to frequent the lake area adjacent to that exhibit each year. Other migrants detected were a cedar waxwing (*Bombycilla cedrorum*) and a wood thrush (*Hylocichla*

mustelina). Resident strikes included mallards (*Anas platyrhynchos*), common grackles (*Quiscalus quiscula*), gray catbirds (*Dumetella carolinensis*), house sparrows (*Passer domesticus*), European starlings (*Sturnus vulgaris*) and American robins (*Turdus migratorius*). The mallards that hit the glass were only dazed and were released after a short monitoring period at the Animal Health Center. These were the only live birds found in conjunction with glass in this data collection period. Several birds that were not found adjacent to glass, but died from head trauma were also reported. These individuals could have presumably hit glass and succumbed to their injuries later. Another instance was recorded just outside the Zoo where two male robins were seen fighting next to a bus stop, and fatally crashed into the clear glass wall of the structure.

The Philadelphia Zoo has recently taken steps to modify existing and new exhibit glass to decrease the risk to wild birds living and passing through the garden. The new McNeil Avian Center, opened in 2009, features exterior frosted/decal window designs that achieve the translucence and aesthetics of glass, but are “bird-safe.” The custom design features bird silhouettes stenciled no further than one-inch apart, which research has shown to be an effective distance to avoid collisions. These windows were included in both seasons of the AAZK window monitoring to determine their effectiveness and in a year’s time, no bird fatalities have been recorded. In May 2010, a prototype window film provided with a recommendation and coordination from the American Bird Conservancy (see Bird Conservation, Spring 2010 in works cited) was installed in the grotto area of the Zoo’s Bear Country exhibit. This exhibit is the first to be identified for retrofitting, thanks in large part to the painstaking record keeping of the Zoo’s pathologist in 2006. The design incorporates “bird friendly” narrow, black horizontal lines spaced one-inch apart as well as the motif of the McNeil bird stenciling to unify the message.



Bird-friendly entry doors to the McNeil Avian Center at the Philadelphia Zoo

(Photo by Wendy Lenhart)

The product is custom-manufactured by SurfaceCare and the budget for the project was just over \$4000.00. It is a major long-term sustainability initiative for the Philadelphia Zoo to address additional exhibits in the same manner. The Greater Philadelphia Chapter of AAZK’s Conservation Committee will be repeating the “hot spot” monitoring again in 2011 to help identify exhibits for future retrofitting. We are in the process of analyzing the data we collected during both field seasons as well. The Chapter will also continue collaborating with the Philadelphia Zoo/Pennsylvania Audubon Lights Out initiative to strive to protect the wild birds of the greater Philadelphia community and beyond.



Window film with horizontal lines and bird silhouettes at the Philadelphia Zoo Bear Grotto exhibit glass

(Photo by Wendy Lenhart)

Acknowledgments

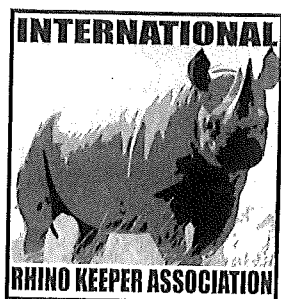
Special thanks to former zoo pathologist, Harley Newton for her dedication to keeping some of the first detailed records of bird collisions at the Philadelphia Zoo. Also a huge thank you to veterinarian, Donna Ialeggio for adding to this database with the help of veterinary technician (and morning window monitor), Martha Vaca. Finally, many thanks to the window monitors Andy Baker, Jeanne Caruso, Amanda Egen, Stephanie Eller, Laurie Franzke, Jane Gaulton, Jennifer Higgins, Diane Kane, Dawn Madzarac, Samantha Nestor, Barbara Nolan, Tanya Pham, Sean Ployd, Shirley Purring, Shirley Purring, Danielle Quaglia, Maria Schwalbe, Sharon Stauch, Catherine Vine, and Laura Warner who made this paper possible.

We would be thrilled if other institutions would like to start monitoring their own exhibit glass. If you have any questions, or to receive copies of our data collection forms, please contact Lenhart. Wendy@phillyzoo.org.

Works Cited

ABC Teams up with Zoos to Stop Bird Collisions. *Bird Conservation* Spring 2010: 4.

Klem, D. 2006. Glass: A Deadly Conservation Issue for Birds. *Bird Observer* 34(2):73-81.



The International Rhino Keeper Association (IRKA) and the International Rhino Foundation (IRF) have produced a 2012 Rhino Calendar, whose pictures have been submitted by rhino enthusiasts from around the world! The calendars are being sold for \$26 each (including shipping) with all proceeds going towards the purchasing of supplies to help increase effective protection of the rhino populations and the successful prosecutions of wildlife crimes, specifically in selected areas in Zimbabwe and the Republic of South Africa. If you are interested in purchasing a calendar to help the IRKA's and IRF's cause please visit www.rhinokeeperassociation.org or email IRKACalendar@gmail.com.