Bird-Safe Design Practices

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This tutorial was developed for architecture students. It is equally applicable to practicing architects and building owners.

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Every year billions of birds die when they fly into windows and glass walls. This is the number-one way birds die.

There are, in North America, over 330 million people and the buildings-with-windows to support them. **If each person has a window that kills just one bird per month, that is over 4 billion birds killed per year**.

Unfortunately, many buildings –especially those with highly reflective glass– kill hundreds, even thousands, of birds on a regular basis.

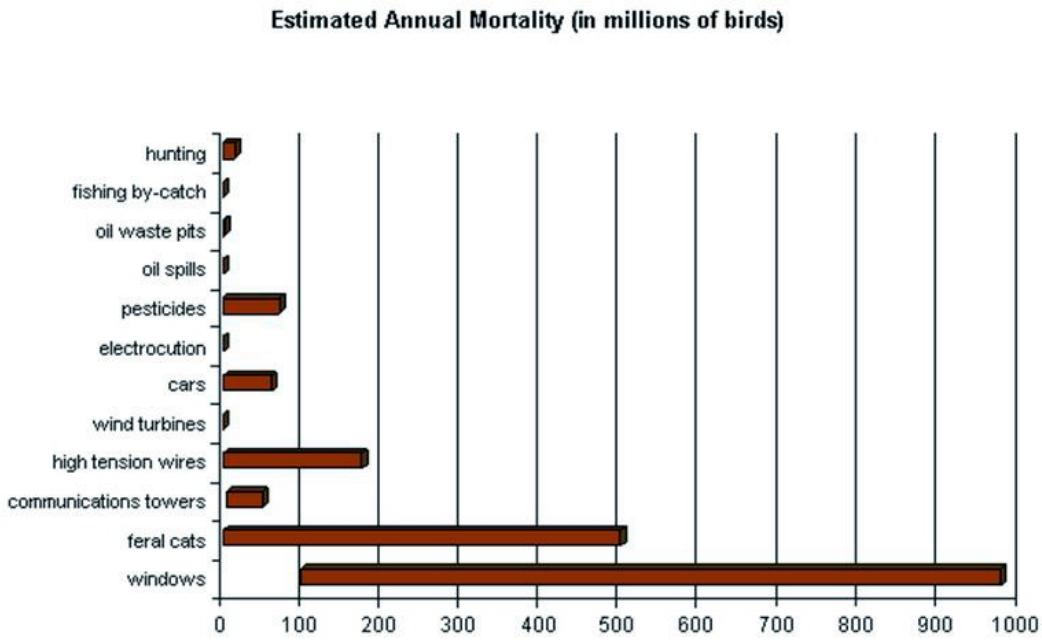
This situation went from serious to critical during the 20th Century. Biologists and conservationists bemoaned the problem - but that's all they could do.

This is **not** a problem that the members of the biological science community can solve.

It is a building design issue. Architects, designers and builders must take action.

Birds fly into windows because of the way buildings have been designed and/or constructed (albeit unintentionally). It is not because of bad luck – bird collisions are caused by deceptive designs.

Man-Made Hazards



I've included this graph to illustrate the different ways birds are dying due to human actions.

The graph is several years old but the relative relationships have not changed. The experts have stopped even trying to count the deaths through window collisions.

Hunting organizations like Ducks Unlimited have conserved millions of acres of wetlands to compensate for the "damage" done by hunters.

Public and private organizations are actively involved in preventing the by-catch deaths.

Likewise, oil spills and pesticides hurt humans as well as birds (and other species); efforts to prevent harm to one group helps all.

The number of birds killed by turbines, high tension wires and towers has grown since this graph was done, however, those industries are actively involved in developing solutions.

Feral cats are clearly a significant killer of birds. Feral cats are also a public nuisance in many areas; local governments, humane societies and other animal welfare groups are actively involved in solving the problem.

That leaves windows. To date, architecture organizations have expressed virtually no interest in being involved in engaging their members to solve this critical problem.

Tutorial Agenda

- **Bird Basics**

This session starts with a little general information about birds ….

- **Bird Specifics for Windows/Glass**

….followed by a detailed look at the specific characteristics that relate to windows and glass. Those examples are basically the Do-Not-Dos.

- **Bird-Safe Design Practices**
  - **Design Choices**
  - **Materials**
  - **Strategy**

The second half of the presentation is about the Dos. I have a variety of suggestions on ways to design bird-safe buildings.

One of the outcomes of seeing this presentation, we hope, is that you will add your own examples.

Tutorial Objectives

- **Recognize that only architects/designers/builders can stop birds from flying into windows**

It is not an environmental problem that the conservation community can solve.

- **Understand the basic design features that attract and kill birds**

- **Gain familiarity with the various ways to prevent bird collisions through design and materials choices**

This tutorial is intended to be a thought-starter for architects and designers. The suggestions offered have been identified by the conservation community, the least likely group to be giving design advice.

Bird Basics

A Class of the Animal Kingdom

Birds are a Class of animals – like Mammals are a Class of Animals. This differs from dogs, for instance. Regardless of their differences in appearances, dogs are one species. That's how we get cocka-poodles.

- **~10,000 species of birds worldwide; 900+ in North America**
- **Each species has a distinct role in the ecosystem**

Each of the bird species plays a different role in the earth's ecology. When one species goes extinct, its job in keeping the planet healthy may not be picked up by other animals.

We don't know how many birds exist; there will never be the resources to count birds the way we count people. To a great extent, if we can afford to count the entire population of a species of any type, that species is near extinction.

However, the Audubon Society has published reports on populations of selected bird species that have been tracked since 1966; the reports show many species have lost over 90% of their numbers in the last 4 decades.

One last fact about bird populations: In the 19th Century over half of the birds in North America were of one species, the Passenger Pigeon. The entire species was wiped out by the end of the century – it can happen that quickly.

The Eco-Role of Birds

Birds have four main jobs

- Pollinate plants
- Disperse fruits
- Eat rodents and insects

About 30% of the earth's plant life must be manually pollinated – by birds, bees, bugs.

Those are locusts on the left. That's what they look like in a plague.

And you get a plague of locusts and other bugs when there are no predators – birds-around to control their populations.

About 50 years ago the Chinese dictator decided that birds were responsible for the failure of his agricultural programs. Thus, he ordered the peasants to kill the birds. With hundreds of millions of peasants on the job, it only took a couple of months to succeed.

Everything seemed great….until the locusts took over. Historians describe the Chinese countryside literally blanketed in bugs. The citizens had to rip out the bugs' food supply – all of the plants, including even grass.

The environmental damage that resulted is still a problem (e.g. serious dust storms).

Birds are Everywhere

Forests
Shrublands

Grasslands
Wetlands

Rooftops
Gravel Patches

Campuses
CBDs

I know that you know that birds are in trees in the parks, even this luxurious garden in an office park.

What you need to understand is that birds are everywhere. Birds go where bugs are and bugs are everywhere, including crawling up the side of office buildings.

Some of you may recognize the old Sun-Times building along the Chicago River. Over 50 species were regularly found around the building.

Birds are Everywhere

This is a farm area that is becoming a cemetery. Look how far few and far away the trees are.

And yet, this building has a serious problems with birds flying into the windows, even including the narrow horizontal windows.

The architect is designing additional features to make the windows more visible to birds.

I only captured one bird in this picture but the building was covered in birds snacking on the insects.

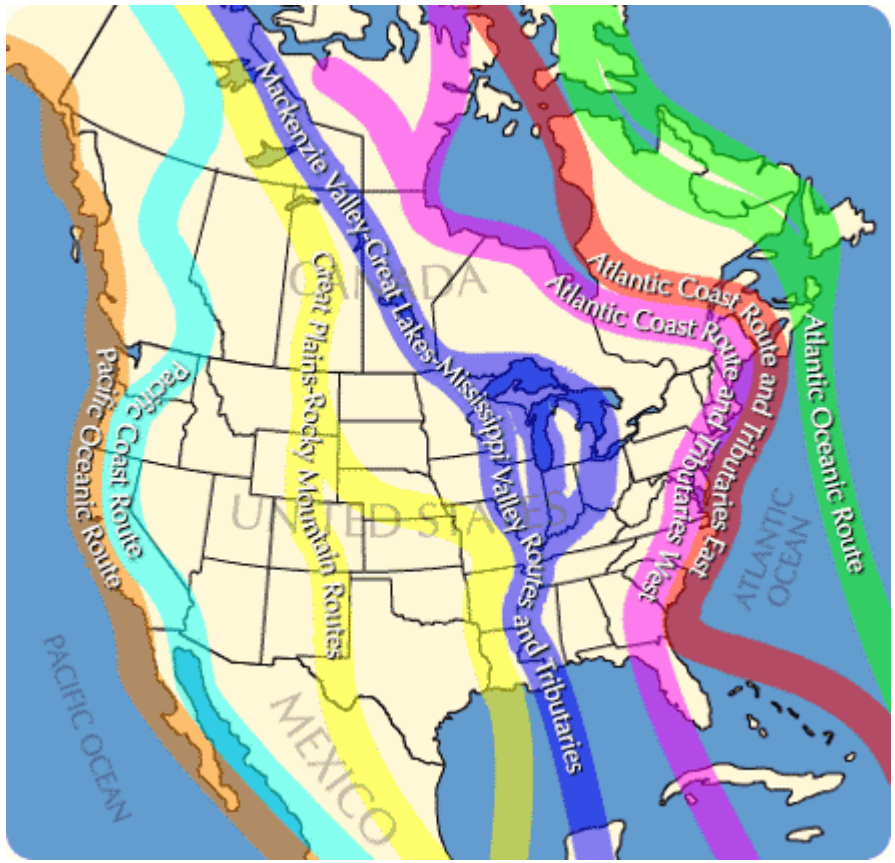
You probably can't see the bird. That's the point of the picture: It is very easy to miss the birds in your neighborhood. They are generally very small and are camouflaged by their colors.

Latitude, Weather and Season …..

…determine the quantity of birds in an area at any given time.

Birds commute – migrate - in search of food. And because they move around, the number of birds in any given area at any given time is a function of the:

- The weather, which helps or hurts migration flights.
- Latitude: The milder latitudes are filled with a large quantity of birds all year round, albeit different species depending upon the season.
- Season of the year. The nicer the weather, the more the birds. However, not all birds head for the tropics in the winter. For some species, Minnesota or Illinois is a mild break from their nesting areas in the Arctic.
- Some larger species, like owls, face periodic disruptions in their food supply, which forces them to migrate when they might not typically do so.



Bird Migration – 5AM

How migration works on a daily basis is that larger birds fly during the daytime and small birds fly at night.

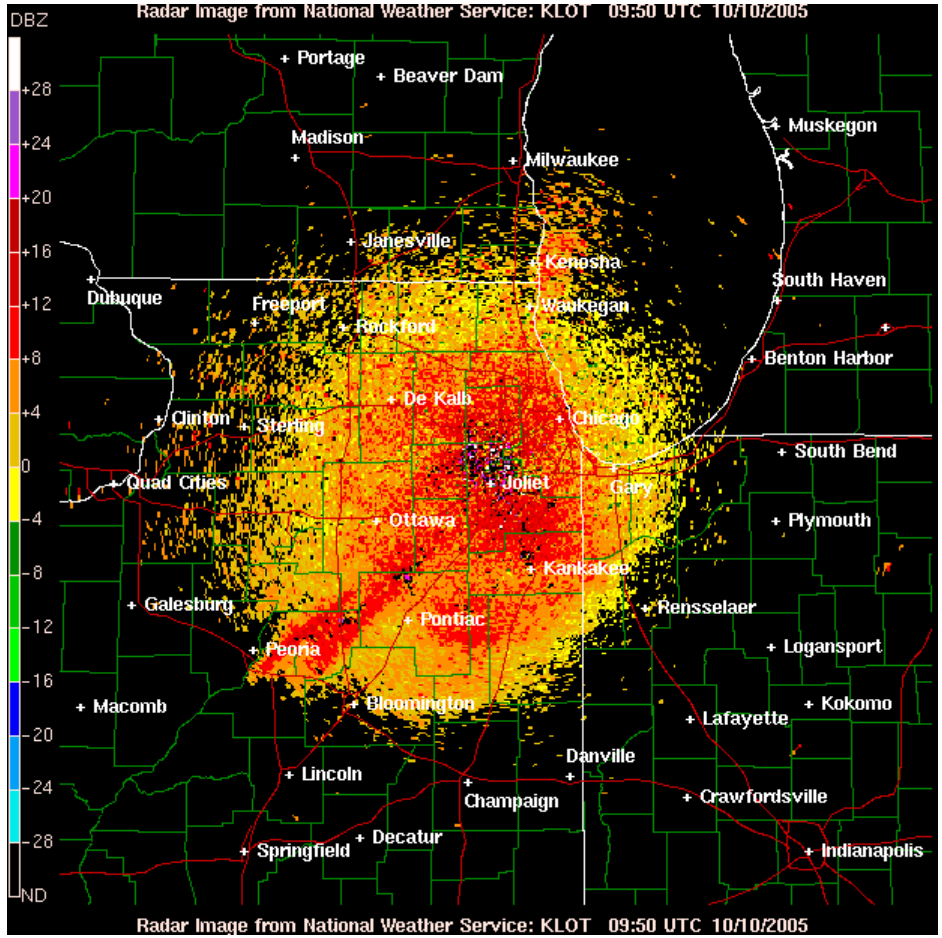
Near dawn the small birds have to land. Birds over a body of water – like Lake Michigan – head for the nearest land area. That's what puts a concentration of birds along shorelines.

And what puts birds in harms way in cities like NY, Miami, LA, Chicago – for example.

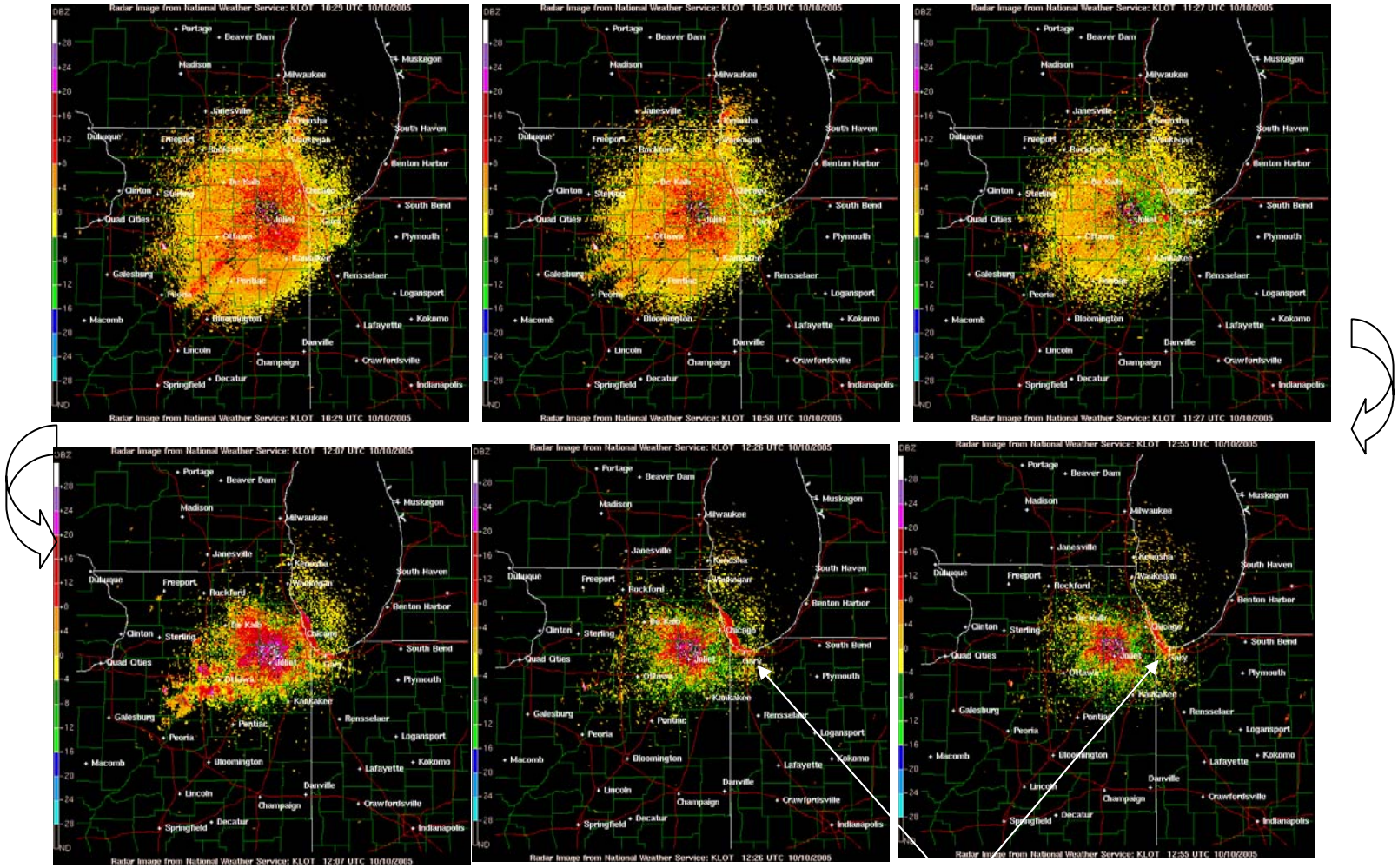
This is a radar shot of the Chicago area from 5am on October 10, 2005. It show the mass of birds (and perhaps some bugs) flying over the area. (The color code is on the left edge of the shot.)

The shots on the following page show the changes as the birds come into the area and settled down from 5:30am to 8am.

Notice the heavy concentration of birds in flight along the lake shore area.



5:30 to 8 AM - 10/10/05



Note concentration along shoreline as the sun comes up.