

Comparing the Effectiveness of Lights Out to Permanent Window Collision Prevention Systems.

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Summary:

[We must compare options and choose the most effective—we are facing a collapse of avian ecosystem. \(Marra, Rosenberg.\)](#)

[Lights Out Claims to prevent 60% of Deaths, it is 30%.](#)

[30% is below the minimum effectiveness standard for a collision prevention system.](#)

Actual level is about 6% because Lights Out only works at night and during migration.

Approved and tested systems (installed at Cornell) save 70 to 95%, migrants and year-round.

Comparing Options Essential

We should compare the options for preventing bird window collision deaths.

In the face of the potential collapse of the avian ecosystem, we must figure out what works best and promote it.

Some advocates of a light-based strategy do not want to make comparisons between the options to prevent window collision bird deaths.

Federal and many state laws require cost/benefit analysis. A comparison of options is required as part of a cost/benefit analysis. A regulation not supported by a cost/benefit analysis in most situations will not withstand a legal challenge. The hard work of many bird-safety advocates will be wasted if a court finds that the lack of a cost/benefit analysis is a fatal flaw in the regulatory process.

Some advocates are convinced that ALAN reduction is the way to go. They believe that a campaign to lower the overall light levels of a city is the best way to reduce bird window collisions. Others propose a Lights Out strategy. A Lights Out strategy aims to convince building owners and managers to turn off their lights during the peak

migration period. I think comparing options is essential to make the best conservation policy.

The discussion is not about whether lights attract birds. They clearly do in some instances. The question is: "Is a Lights Out or and ALAN strategy the most effective strategy to reduce bird window collisions."

I spent decades of my career evaluating the effectiveness of conservation programs - particularly the conservation programs of the Department of Agriculture, as well as the NSF and EPA budgets. I can offer a perspective derived from that experience. He is a biological expert. I am an expert in regulatory programs and program evaluation. I wish Mr. Longacre would see my offerings as constructive and not engage in personal attacks.

We must make choices. For example, should we ask our volunteers to try convince a building owner to turn out his lights out or install a permanent window collision system?

Lights Out 30% not 60%

First, the correct estimate of the effectiveness of the Lights Out program in Van Doren's analysis is about 30%, not 60%.

I was contacted by an ornithologist last year who stated that he did not know "how the Van Doren paper passed peer review." (Not associated with the Acopian Center) One of the items he brought up was the use of 60% in the first paragraph, in contrast to the much lower estimates on page 4.

On page 1. Mr. Van Doren describes how the Lights Out program works. "Lights-out programs, which encourage the public to extinguish outdoor lighting to protect migratory birds, are receiving increasing attention (13). Presently, advisories are generally issued for a given time period (**e.g., peak migration periods**) or on **specific nights when weather conditions are favorable for large migratory movements** [e.g., using migration forecasting, (31, 32)]."

On page 4 , in the long paragraph entitled " Predicted Efficacy of a Lights-Out Program: " Mr. Van Doren states,

"It may not be feasible to extinguish lighting every single night, so we quantified the predicted decrease in mortality if lighted window area had been reduced only on the **nights with the largest 25% of migration events**. In this scenario, we expect a decrease of 32% (95% CI [26, 38]) in collisions in spring and 27% (95% CI [22, 31]) in fall.

In this he is clearly describing the efficacy of the Lights Out program he describes in page 1. I use an average of 30%.

A fair summary of the Van Doren paper would have been "a range of 30 to 60% during nocturnal and migration periods at a unique waterfront facility with a special lighting regime."

Lights Out Below Minimum Effectiveness Standard

Let us start with the simplest comparison. The highest figure in the Van Doren paper is 60%. Several of the permanent systems, such as those installed at the Cornell Lab, save at least 70% - as high as 95% in one published study of both migrants and non-migrants. *PeerJ* 10:e13142 As shown above Lights Out savings is

30%. At 30% it is below the minimum 50% effectiveness standard used by both the Acopian Center and ABC of 50%

Since as described, the Lights Out Program only works at night and during peak migration, I base my analysis on the assumption that it can prevent collisions at those times.

Two Options for Comparing Lights Out to Permanent Systems.

There are two ways of thinking about this question. One is to estimate the potential percentage of the total number or avian collision fatalities Lights Out can prevent. The second is to compare the savings of each option using a sample building. Each of the analyses are illustrative, not an attempt to predict an outcome in any situation.

Potential Percentage of Avian Deaths Lights Out Can Save - 6%

The beginning point of any program evaluation is the question, "If it works as described, how effective will it be? In this case "If we adoption Lights Out as our major tool to prevent collisions, **and it works as van Doren describes it**, what percentage of the avian deaths overall can it prevent."

This chart shows the results.

Goal Prevent 100% of Deaths		100%	
Less deaths at residences	44%	56%	most LO can save when residential deaths dec
Assume 60% of deaths during migration	60%	34%	most LO can save because limited to migration
Assume 60% of deaths during migration at night	60%	20%	most LO can save because only works at night

But only 30% effective in saving night migrants	30%	6%	most LO can save because of limited 30% effectiveness
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Thus, the percentage it can save is about 6%. A very targeted program such as Lights Out - which works only at night, only during migration, only at commercial buildings is inherently comparatively ineffective.

1. Lights Out is not effective at residences. Van Doren agreed in a phone conversation. The Science building, located on a lakeside is nothing like a residential home. Since 44% of collisions are at residences, Lights Out can only save the balance -- 56%. If a person wants to turn their lights out, that is fine. This is a policy estimate, not personal advice. See photo below.
2. Assume 60% of collisions occur during migration – so 34% can be saved by Lights out.
3. Assume 60% of collisions occur at night, so Lights Out can only save 20%. (Many experts do not assume 60% in either point 2 or 3—preferring 50%. I assume 60% to give the benefit of the doubt to the Lights Out system.)
4. It is only effective about 30% of the time. It only prevents night time migrant deaths. So, Lights Out can save 6%.

Conclusion: Even if it works as described it is relatively ineffective.

If you do not understand this analysis, please contact me, and do not post." I do not understand it. Call me at 843-991-1059.

Commercially Available Tested Systems Save 70% to 95%

Comparing Effectives at a Sample Building

Our goal is to save as many birds as possible at a particular building. Should we ask our volunteers to convince a building owner to turn out lights out or install a permanent window collision system?

Assume that about 20.7 birds are killed in the average commercial building. (Loss et al) What shall we do? Turn out the lights during migration or install a permanent bird window collision system of the type that Cornell has installed on its windows and of the type recommended by the National Audubon collisions working group?

Here are the assumptions and results;

Loss Estimate of Annual Deaths at Low-Rise	21.7
number of deaths assumed at night -	60%
night deaths	13.0
efficacy of Lights Out p. 4	31%
night deaths saved	4

Being conservative, let us assume that a permanent system can save only 80% (between 70% and 95%) So it will save 16.56 birds. So even before we add the value of the permanence of the permanent system it is 4 times more effective than a Lights Out system.

The number of birds saved by the Lights Out approach must be reduced by the fact that it is only saving birds during the night, as many migrants fly and come to the ground to feed in the day as at

night and it is not protecting birds outside the migration period. Because the permanent type systems such as were installed by Cornell at its own facilities are effective both day and night and year-round, it is not necessary to discount their effectiveness.

<https://www.allaboutbirds.org/news/advances-in-window-safety-come-to-the-cornell-lab-and-cornell-campus/#>

Summary

We must make choices. We cannot do everything. The information I offer here informs our choices.

There are many other issues with a lights management approach which are not addressed here. This material does not address the effectiveness of an overall of ALAN reduction strategy. It is limited to a comparison of buildings in an urban context.

- Mr. Cubie worked in the U.S Senate for 12 years in various positions. He was the Democratic staffer responsible for evaluating the policies and programs of 7 Federal agencies, including EPA and NSF. In that position he succeeded in adding funds for the early basic research on global climate change which developed the scientific basis for the present policy. He then served as Chief Counsel of the Senate Agriculture Committee where he was responsible for all legal matters, evaluating new legislative proposals. During his tenure there was a major reorganization of the Department of Agriculture in which he played a major part. He specialized in farm conservation matters. He developed the Wetland Reserve Program and secured over a billion dollars to restore 2 million acres of drained land. After leaving the Senae he organized a non-profit which developed

innovative solutions to conservation barriers. One proposal, to reduce the risk perceived by farmers when they changed nutrient management systems, was approved by the Board of the Federal Crop Insurance program. He was also responsible for the energy and environmental policy development for a presidential campaign. He can be contacted at jimcubie1@gmail.com