

Strategies for Reducing Bird Deaths as a Result of High-rise Developments

Introduction

According to a 2002 report produced by the Fatal Light Awareness Program (FLAP) examining the relationship between high-rise buildings and migratory birds, increased building size and lighting levels are directly connected to the number of birds that die each year from colliding with buildings. Urban municipalities such as London that are experiencing growth in the number of large buildings need to ensure that steps are taken to account for the effects that large-scale development has on the surrounding environment. This is not to say that a choice needs to be made between development and environmental protection. In fact, a number of municipalities have developed policies and guidelines designed to reduce the amount of migrant bird deaths caused by tall buildings without hindering any growth or development.

Notable examples of growing municipalities working to reconcile development and protection of migrant birds include Toronto, Calgary and Markham. These Cities have implemented a set of bird-friendly policies that offer strategies that could be adopted in London. These strategies align with London City Council's Strategic Plan goal of providing "A Green and Growing City" as well as London citizens' recognition of the need to evaluate 'How we Grow' and 'How we Green' under the ReThink London Initiative.

This report outlines the effects that large buildings have on local and migrant birds as well as a number of bird-friendly planning policies in other municipalities. London could easily implement a set of voluntary bird-friendly design guidelines that would reduce the number of bird deaths caused by local development without hindering growth.

Local Bird Migration

The Ontario Ministry of Natural Resources has identified 483 different bird species in Ontario, 12% of which are considered to be of provincial conservation concern. The most recent annual bird count in the London-Middlesex area found 237 different bird species either living in, or migrating through the area. Although no study has yet been done into the number of bird-window collisions in London, counts from the Fatal Light Awareness Program (FLAP) in Toronto estimate that a building will cause up to 10 deaths per year. A 2000 count in Toronto's downtown shows over 37,000 deaths. This count was performed by two or three volunteers on a pre-set route each night in Toronto's downtown between the hours of midnight and 9:30 AM. This means that any birds that collided with buildings not on the route or that were able to fly to other areas before dying are not included in the estimates suggesting that the number of bird-window collisions is in actuality much higher. The United States Fish and Wildlife service estimates that at least 97 million birds die in North America each year as a result of building collisions with between 50-90% dying after the collision as a result of internal haemorrhaging.

The Effects of Large Buildings on Birds

In 2002, FLAP examined the relationship between building height, lighting levels and bird collision deaths. This study found that both building height and the amount of light pollution being emitted from large buildings are significant factors leading to bird deaths. Interestingly, the amount of light pollution caused from buildings is a more significant factor than the actual height of the buildings. The study – conducted in Toronto – found that some of the tallest buildings had lower bird collision rates simply because they had implemented light reduction programs as part of their bird friendly policies.

A 2008 study published in *Ecology and Society* finds that artificial lights interfere with birds' ability to orient themselves due to effects on visual cues and birds' magnetic compass. According to ecologists, the majority of birds migrate at night and use different light wavelengths to navigate via a magnetic compass mechanism. Artificial light from buildings introduces wavelengths that disorient birds and in many cases cause them to fly towards the light source – a commonly used term for this phenomenon is 'fatal light attraction'. The disorientation can cause affected birds to fly around until they are exhausted and either drop to the ground or collide with a building causing death or injury.

Regardless of the link between building height and lighting levels, the most significant reason that birds collide with buildings is an inability to identify that windows are solid. This can manifest in three ways. First, a window that reflects open sky may not be recognized by a bird as a solid object resulting in collision because the bird believes it is flying through open space. The second is a more deliberate action in which the bird attacks its own reflection believing that it is a competitor for territory. These collisions do not always result in death but can cause serious harm because many birds will continue to attack their reflection until they are exhausted. The third reason that birds collide with windows is reflections of trees and other natural landscaping misleading birds who attempt to reach the reflections rather than the actual plants.

Bird-Friendly Planning Policies

There are a number of very simple strategies for reducing the impact of large buildings on migrating birds. These range everywhere from designing new buildings with birds in mind; adding visual markers to existing buildings to help birds identify windows; and implementing light reduction measures to reduce the effects of light pollution. A number of cities have implemented bird-friendly programs and some of these are detailed below. In general, the policies are not mandatory for property owners to follow, but consideration of the policies are incorporated into the planning application approval process. Some cities operate a bird-friendly certification program for buildings that adopt these measures. The incorporation of these strategies as voluntary design guidelines allows municipalities to encourage building designers and owners to implement some protection measures without dramatically increasing the cost of development.

City of Toronto

In 2006, The City of Toronto implemented “Bird-Friendly Development Guidelines” for new and existing buildings and the “Lights Out Toronto!” public awareness campaign.

The Bird-Friendly Development Guidelines are a list of design strategies for developers, building managers and owners, architects and planners who wish to make buildings safer for migratory birds. None of the measures on the list are mandatory though developers are instructed that some consideration of bird-friendly features should be incorporated into the building design and site plan. The program operates similar to the LEEDS environmental program: there are three levels of bird-friendly certification that building managers and owners are able to apply for. For each level of certification, one of three artistic prints is provided that can be put on display in the building to indicate the bird-friendly status. The program also allows building managers to advertise their bird-friendly status when renting space. The list includes five major design-based strategies:

1. Creating visual markers on glass windows. This ranges from minimizing the distance between features or patterns to applying patterns, films or decals to non-reflective windows. Alternatives include installing decorative grills or artwork in front of windows. The goal is to ensure that birds are able to identify glass windows as solid objects to be avoided. These strategies are most effective when the distance between visual markers is between 28 and 10 centimetres or less.
2. Strategies for muting reflections on glass. These strategies are also intended to provide a visual cue to birds by reducing the perceived reflection and indicating that windows are solid. These strategies range from angling glass panels to installing screens, shades or awnings.
3. Reducing external light pollution. These strategies focus on reducing light pollution from lighting sources outside or on buildings. This includes choosing lighting fixtures that project light downward rather than upward and are targeted to reduce the amount of light spilling into unnecessary areas.
4. Building management operations: These strategies focus on reducing light pollution from within buildings. This includes options such as turning off all unnecessary interior lighting and the use of motion sensor lighting.

5. Site design strategies: These strategies are intended for new developments and include incorporating a wide range of site design measures into the site plan design. This includes strategic design and placement of lighting, site ventilation and outdoor spaces.

The “Lights Out Toronto!” program is simply a public awareness campaign that encourages downtown building tenants and owners to implement light reduction policies. This can be as simple as office buildings turning their lights off overnight. Other strategies include installing motion sensor lights or automatic shutoff switches that ensure that lights are only on when the buildings are in use.

City of Calgary

In 2011, The City of Calgary implemented their own “Bird-Friendly Urban Design Guidelines” as part of their Environmental Policy. As in Toronto, these guidelines are not mandatory but are included as part of the planning application approval process. Calgary identifies their downtown as a critical area of focus because the proximity to the Bow River makes it a preferred nesting area for birds. This is similar to the landscape in London where our downtown core is adjacent to the Thames River. The guidelines do not apply city-wide and are instead limited to a pre-determined area. Many of the guidelines are similar to Toronto’s and include measures such as:

1. Increasing the density of visual markers with an ideal spacing of 28 to 10 centimetres.
2. Adding films, decals or etchings to windows to reduce window reflectiveness and transparency without reducing the amount of light entering buildings.
3. Installing sunshades or louvers over reflective glass to interrupt reflections and prevent birds from seeing reflections as open sky.
4. Ensuring that enclosed areas in which a bird could become trapped are clearly defined by sharp edges and no reflective glass so they do not appear as open flyways.
5. Using awnings, blinds or curtains to make glass more opaque.
6. Angling glass panes downwards to reduce reflections of sky and surrounding landscape.
7. Locating interior plants away from windows.
8. Reducing site and building lighting levels.
9. Reducing nighttime usage of interior lights.

City of Markham

The City of Markham’s Council recently (Feb. 11, 2014) endorsed a set of Bird Friendly Guidelines. Markham staff found that reducing the reflections of landscaping near buildings led to a reduction in collisions. Markham’s bird-friendly guidelines are very similar to those seen in Toronto and Calgary. One major difference is that Markham has an added focus on the area of the building façade that is within 16m from the finished grade. The policy notes that bird-friendly design can be implemented for the entire building, but focusses on the area closer to the ground as a ‘high-risk’ area. This allows the city to plant street level trees and landscaping without increasing the risk of bird-window collisions. This helps create a more walkable urban streetscape. Markham divides the guidelines into three categories: 1) Primary Treatments intended for anything within 16m of finished grade; 2) Secondary Treatments intended for the ground level; 3) Lighting Treatments intended to reduce the effects of nocturnal light pollution. The specific guidelines are similar to those seen in Calgary and Toronto.

Benefits to Bird-Friendly Design

There are a number of benefits to implementing bird-policy designs both for communities and for building owners and operators.

- First and foremost, implementation of bird-friendly design reduces the number of bird deaths. This helps maintain a vibrant and healthy environment and in turn increases the livability of the city.

- Bird-friendly design and certification allows individual buildings and the city to be promoted as 'green'. This makes the buildings and community more attractive to prospective tenants and in some anecdotal cases has been seen to increase rental value and attractiveness to potential tenants leading to reduced vacancies.
- The light reduction strategies outlined in many bird-friendly guidelines decrease electricity use in large buildings. This results in lower expenses for building owners and tenants and reduced demands on the power grid.
- Many bird-friendly design strategies qualify towards LEED certification credits.
- Public education and voluntary design programs allow cities to promote bird-friendly design without mandating it. This helps encourage the design without reducing the attractiveness of the city to potential development.

Conclusion and Recommendation

As citizens continue to expect municipal commitment to environmentally friendly and sustainable developments, there will be increased demand to pursue initiatives such as bird-friendly guidelines. By implementing this type of development guidelines, the City of London can signal its commitment to being **A Green and Growing City** as outlined in the Strategic Plan without creating negative effects on growth. In fact, this type of strategy will contribute to building a reputation as being a forward-thinking city with a commitment to environmental sustainability and innovative planning practices. A set of voluntary guidelines for new developments paired with a formal bird-friendly certification program would be most effective in encouraging developers and building owners to join London in its commitment to environmental sustainability. It is recommended that The Planning and Environment Committee and City Council approve an examination of bird-friendly design guidelines that could be implemented in London.

References

City of Calgary. "Bird-Friendly Urban Design Guidelines".

<<http://www.calgary.ca/PDA/LUPP/Documents/Publications/bird-friendly-design-guidelines.pdf?noredirect=1>>

City of Markham. "Bird-Friendly Guidelines".

<<http://www2.markham.ca/markham/ccbs/indexfile/Agendas/2013/Development%20Services/pl131022/Markham%20Draft%20Bird%20Friendly%20Guidelines%20October%202013.pdf>>

City of Toronto. "Bird-Friendly Guidelines, Development Rating System".

<<http://www1.toronto.ca/wps/portal/contentonly?vnextoid=c5f20621f3161410VgnVCM10000071d60f89RCRD&vnextchannel=c64a036318061410VgnVCM10000071d60f89RCRD>>

Evans Ogden, Lesley J. "Effect of Light Reduction on Collision of Migratory Birds". Fatal Light Awareness Program (Jan. 2002), <http://www.flap.org/pdfs/ELRCMB_BFB.pdf>

Ontario Ministry of Natural Resources. "Birds".

<http://www.mnr.gov.on.ca/en/Business/Biodiversity/2ColumnSubPage/STEL02_166930.html>

Poot, H., et al. "Green Light for Nocturnally Migrating Birds". Ecology and Society 13(2): 47, (2008), <http://www.ecologyandsociety.org/vol13/iss2/art47/>

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