

Preventing Bird-Window Collisions at University of Toronto Mississauga



“Consider Glass as a
Canvas”

Michael Measure, 2011 FLAP

ENV232 Final Report

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Abstract

Ms. Lisa Kramer commissioned ENV 232 to further research on bird fatalities at UTM.. Reflective and transparent windows pose a significant threat to migratory birds. Our research, conducted from September 6th 2011 to November 28th 2011, has been focused on the practicality and effectiveness of Vinyl Window Decals in deterring birds from flying into glass. Previous research has reaffirmed window decals are the most effective when placed 5- 10 cm apart on a transparent glass surface. The implementation of decals on the Kaneff Centre inner circle has been proposed in this paper. Decal cost, lifespan (durability), and use at UTM was also analyzed, as well as future recommendations to increase bird safety at UTM.

Introduction

University of Toronto at Mississauga (UTM) is located on 225 acres of land overlooking the Credit River Valley. It is necessary to recognize that the campus is not only a space for people but inhabited by numerous other species, it is a place of coexistence of people and animals. It is also essential to recognize if any harm is posed to any of the different species which UTM is home to. Since UTM is situated in a location surrounded by so much green space and natural habitats, it houses migratory bird populations, especially during spring and fall migration seasons. See-through and reflective windows on campus buildings are a serious threat to these migratory birds.

Collisions with windows are a significant source of avian mortality and is estimated to be in the billions worldwide (Klem, 1990). Besides habitat destruction, bird-window collisions are estimated to be the largest human associated source of avian death. (Klem, 2006). Two types of

windows have been reported to be hit by birds, transparent windows and reflective windows. The transparent windows give rise to the so called 'fly-through effect' and appear as if invisible to birds. Reflective windows give rise to a 'mirror effect' where birds tend to see these as an extension of the facing outside habitat (Klem, 1989). Many birds fly into transparent and reflective windows as if unaware of their presence. Up to 67% of the collisions result in death (Gelb and Declacretas, 2009). It has been estimated that 1-10 birds are killed annually at each building annually. However, there is variation in building size and amount of building which all affects the numbers of bird deaths at buildings.

A previous study has identified three main sites where bird fatalities occur at UTM. These are the CCT-South Building Courtyard, the CCT site adjacent to forested area and the Kaneff Centre (Chow et al. 2010). The same study estimated that 168-240 birds die each year by colliding into windows at UTM. Everything else remaining the same, this number would be even greater for this year (2011) since UTM has an addition of two new buildings, the IB building and the UTM Health Sciences Centre. The IB Building, in particular, has a considerable amount of reflective and see-through windows.

However, one mitigation opportunity is to apply decals to windows. A decal is a plastic, cloth, paper or ceramic substrate with a pattern or image on it, and can be moved onto different surfaces. Window decals make windows visible to birds and they are seen as obstacles instead of a continuation of the natural area. Studies have shown that by uniformly applying

decals to windows, with a 5-10 cm gap between the decals, bird strikes can be completely eliminated at these windows (Klem, 2009).

As mentioned above, the Kaneff centre was one of the main sites identified where bird fatalities occur. The windows this site is ideal for the initial implementation of window decals since it is a high risk area for birds, it has relatively fewer windows, and it has been granted, as a result of previous ENV232 work, approval by upper administration for application of window decals.

The purpose of this report is to (1) to explain why birds collide with windows, (2) to put forward a solution to this problem by proposing the application of decals on the windows of the Kaneff Centre inner circle, and (3) to develop a set of recommendations to make UTM a sustainable campus for not just us humans, but also migratory birds.

Methods

An interview with Paull Goldsmith, the director of facilities management and planning, was conducted on September 21th in order to learn about the policies on placing objects on UTM windows. Also, an interview was done with Kris Horvath on September 28th, who is the head of grounds keeping on campus, to learn about the bird window collisions on campus and discuss the data logs in which campus bird fatalities have been recorded.

Many decal companies were searched online. These included Decalboy, Maverick Labelling, Custom Vinyl Wall Art Silhouettes, Eye Catching Prints, which are all web based companies.

The idea of letting the decals be advertising spaces for student groups was investigated. To learn whether student groups would be interested, some student groups, such as Green Team, Campus Roots, the Student Management Association and the Undergrad Commerce Society were contacted. Also, an example of a constitution for a prospective student group, who would take on the maintenance of the decals and pushing for decals to be applied to other buildings at UTM, has been written.

Results

It can be seen in figure 1 that UTM is part of a bigger natural environment. The credit river can be seen in the figure as well as the forest and other green space that the campus is surrounded by.

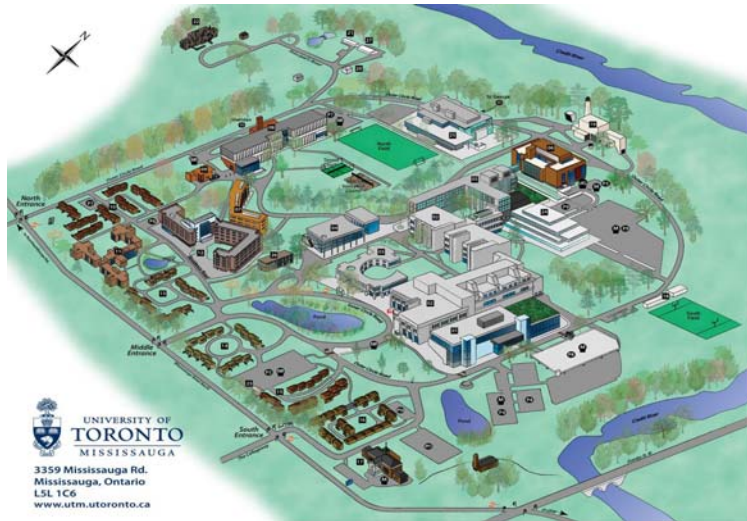


Figure 1: Map of University of Toronto at Mississauga.

The relevant outcomes of the interviews with Paull Goldsmith and Kris Horvath are seen in Table 1. Kris Horvath would not provide us with an example of what the logs look like or any additional information on how accurately the reporting was.

Interview with Paull Goldsmith	Learned that no advertising can be placed on UTM windows.
Interview with Kris Horvath	3 birds and 1 goose reported dead from window collisions

Table 1: Main outcomes from interviews with the stakeholders, Paull Goldsmith and Kris Horvath.

A summary of the decal companies found as potential companies to buy decals from are presented (Table 2). Decalboy, Maverick Labelling, Custom Vinyl Wall Art Silhouettes and regular poster paper were evaluated based on decal type, size, durability, total number of decals required for the Kaneff Centre inner circle windows and the cost.

Decal Companies	Decal Type	Size	Durability	Total Number of Decals Required	Cost
Custom Vinyl Wall Art Silhouettes: Circle Print	Clear Adhesive Vinyl	45" in height	High	64	\$11904.00*
Custom Vinyl Wall Art Silhouettes: Three Birdies Print	Clear Adhesive Vinyl	22" in height	High	160	\$10,320*
Custom Vinyl Wall Art Silhouettes: Oval Print	Clear Adhesive Vinyl	22" in height	High	160	\$8128.00*
Decal Boy. com	Clear Adhesive Vinyl	3" x 3" (7.6 cm x 7.6 cm)	High	1500	\$5,242.50*
Maverick Label. Com	Clear Adhesive Vinyl	3" x 3" (7.6 cm x 7.6 cm)	High (Service temperature is -28°C to 80°C.)	1440	\$834.24**
Poster Paper	Paper	3" x 3"	Low	22 (22" x 28") black posters	\$44.00

Table 2: Information on various decals from Maverick Decals, Decalboy.com and Custom Vinyl Wall Art Silhouettes.

Amount and measurement of Kaneff Centre inner circle windows: **32 windows (322.6 cm x 132.1cm)**

Discussion

The presence of so much green space on and around our campus makes UTM a place where migratory birds fly and rest. Studies have shown that windows that are surrounded by vegetation get stricken by birds more frequently than other windows (Borden et al, 2008). As a pathway for migratory birds, UTM needs address the problem of bird deaths due to man made structures.

This year, three small birds and a Canadian goose were found dead by groundskeepers at UTM according to logs that were implemented in the beginning of the year. Considering that the amount of bird deaths last year were estimated to be 168-240 on the campus, these new numbers indicate either a great decrease in the number of bird populations at UTM, lower number of bird collisions by chance, or inaccurate log keeping by the groundskeepers. Studies

have shown that the presence of reflective and transparent windows will result in bird strikes and bird deaths as a result. Studies have shown that 1-10 birds die annually at a single building as a result of window collisions (Klem, 1990). It is thus possible that this year did not have many bird-window strikes resulting in such a low number. Further, it has been shown that season has an important effect on the number of bird strikes. More bird collisions have been reported during spring and fall migration than summer and winter (Borden et al, 2010, Gelb, Y., & Delacretaz, N. ,2009, Hager et al, 2008). Since the information on the number of bird deaths at UTM windows were provided to us in September, which is just the beginning of fall, it is reasonable to say that this number may go up by the end of the year. The issue of bird-window collisions is thus still significant and needs to be given attention.

The different decals that were researched were weighed against each other based on decal type, size, durability, total number of decals required for the Kaneff Centre inner circle windows and the cost. Based on the findings presented in Table 2, we have concluded that Maverick Label decals is the most feasible option because their vinyl decals are customizable and the cost, \$834.24, is the lowest relative to the other companies presented. Black poster paper was considered as an option because of its low cost; however, it is not durable and would have to be replaced frequently.

As a sustainable campus, it is important for us to implement a window policy which is not hazardous to birds. We should at least aim at reducing the risk. By allowing decal application on the Kaneff Centre inner circle windows, risk of bird strikes in an area where bird

strikes have been observed previously will decrease. We believe that taking action will not only allow UTM to take a step closer to sustainability regarding bird-window collisions, but also make UTM a role model for other universities where similar problems may have been observed.

Recommendations

The companies that have been researched should be considered by Paul Donoghue. The spacing between the decals should ideally be 5 to 10 cm apart to be most effective, however, the spacing could be increased with increased risk for bird strikes. An example of what a bird decal looks like is provided in the appendix.

Since larger foundation such as Environment Canada and the CVC focus on species at risk and endangered species, funding for decals must come from within UTM. To implement, monitor, and maintain decals on Kaneff inner circle windows, creative ideas such as fundraising could get students and staff involved and aid in funding the decals. One such student group is campus roots which focus on renaturalization on campus through various activities and grant exploration.

An electronic database would be a beneficial addition in bird mortality monitoring. A website would be ideal in housing the raw data collected from Kris Horvath and promoting bird safety practices at UTM. The website would also store past, current and future research conducted at UTM in regards to avian death caused by window collision. The website has

potential to be an active monitoring system for both the Department of Geography and the Department of Management.

We recommend that the data logs, where bird deaths are recorded, implemented this year be continued. Stricter rules and guidelines need to be implemented for more accurate recording of actual bird fatalities occurring on campus.

We also recommend that once enough data has been collected on this issue, that a student group be developed which can maintain and monitor the decals, as well as push for implementation of decals on other buildings at UTM. An example of constitution for a potential student group is provided in the appendix. The constitution provides guidelines on how a group will function. The constitution would hold all the facets of a student group and still allow future interpretations to focus on bird activities on campus.

Further work on the implementation of our recommendations and the monitoring of the status of bird fatalities at UTM should be pursued by another ENV232 group in upcoming years.

Acknowledgements

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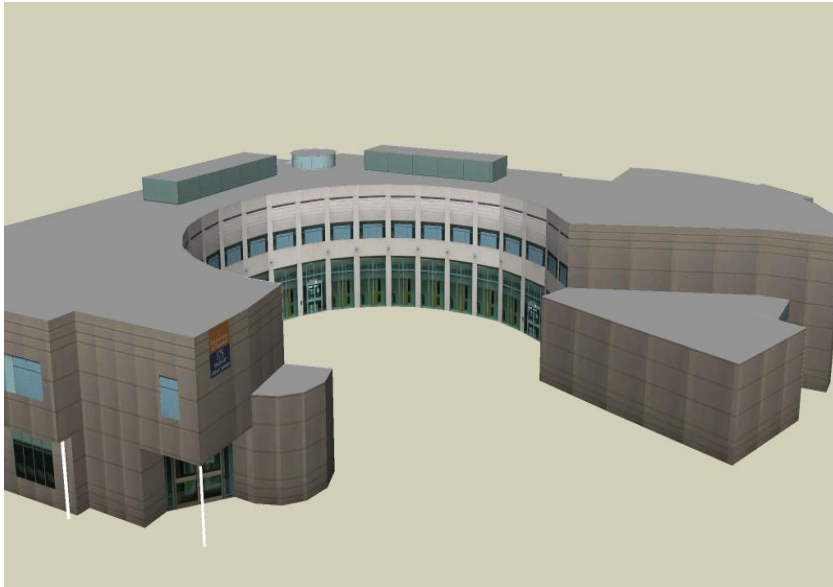
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Appendix 1

Bird Decal



A sample decal to be placed in the Kaneff Inner Circle window.



Society Constitution
In Accordance to the Academic Societies Constitution
The University of Toronto at Mississauga Students Union
(ASAC)

ARTICLE I: Club Name

The Toronto “INSERT CLUB NAME HERE”, referred to as “ACROYNM HERE”-UTM

ARTICLE II: Objectives and Duties

Section 1: The object of “ CLUB NAME HERE” shall be to:

- Act as mediators between faculty and students
- Provide information to gain public support and boost awareness
- Organize academic and social events

Section 2: The duties of “CLUB NAME HERE” shall be to:

- organize class representatives to convey announcements as deemed important by the “CLUB NAME HERE” executive
- support important events happening within the UTM Community
- Offering students information sessions, and provide community outreach.
- Create and host social activities that promote and reinforce the voice behind bird health on UTM

ARTICLE III: Membership

The following persons shall be members of the “CLUB NAME HERE” organization:

- Any undergraduate student enrolled in at University of Toronto at Mississauga who has paid incidental fees or any alumnus of the university as an associate, non-voting member
- The current Clubs Commissioner is acknowledge as an immediate honorary member
- A faculty member appointed by the Geography Department, to act as a representative, and signing officer for “CLUB NAME HERE”

The following persons are eligible to be members of the “CLUB NAME HERE” executive committee:

- Currently enrolled full-time students, or part-time students who have paid their University of Toronto incidental fees.
- Must have been a member of “CLUB NAME HERE” for at least one year (waived the first year of “CLUB NAME HERE”)

ARTICLE IV: Membership and Membership fees

1. Basic Membership is held by anyone who pays the levy to the “CLUB NAME HERE”
2. Premium Memberships may be offered to all students depending on yearly activities, and such fees will be determined by the Society. Formal notification must be provided to UTMSU that will list Premium features or benefits of having an Enhanced Membership as opposed to Basic Membership.
3. Membership information will be kept confidential and secure, and not duplicated for any reason, without consent from the individuals.
4. Membership Registration is completely optional and all information supplied by the individual in the form of his/her Name, Email Address, and/or Student numbers are collected by the Society and used at the Society’s discretion.

Section 1: Distribution of Levy and Procedures

- Money that is not spent will be kept in the bank and rolled over to the next academic year.
- A Progressive Accounting practice will take place to ensure that 10 % of “CLUB NAME HERE” entire monetary budget will remain in the bank account.
- Authorization for use of funds will require consent and signature of the Society’s Treasurer, and either the President or Vice President.
- Documentation will be needed prior to the provision of money, and a log will be kept to ensure responsibility of all funds removed from the account.
- Further documentation will be recorded in a ledger kept by the Treasurer, and all receipts will be kept with this log as well as all bank statements.

ARTICLE V: Executive Council

President (one or two positions)

- Attend joint club and ECSU meetings
- Co-signer of “CLUB NAME HERE” finances
- Must have been on the “CLUB NAME HERE” executive for at least one year (waived the first year of “CLUB NAME HERE”)
- Fulfill duties which other members of the executive are unable to complete
- Oversee executive member’s duties
- Provide leadership and organization
- Establish a strong link with the UTM community.

Vice-President (one or two positions)

- Provide assistance to the president in any “CLUB NAME HERE” affiliated matters
- Step in to oversee “CLUB NAME HERE” operations if current president(s) is/are unable to.
- Must have been on the “CLUB NAME HERE” executive for at least one year (waived the first year of “CLUB NAME HERE”)
- Help to oversee executive member’s duties and help to fulfill those duties if executives are unable to

Treasurer (one position)

- Manage “CLUB NAME HERE” finances, ECSU grants, public funding
- Provide financial reports when required
- Co-signer of “CLUB NAME HERE” finances

Secretary (one position)

- Record minutes (including attendance) of all “CLUB NAME HERE” meetings
- Is responsible for ensuring all executives receive a copy of meeting minutes as well as posting all minutes within 72 hours (3 business days), for public viewing.
- Is responsible for providing a monthly schedule of confirmed events, to be given to the President of “CLUB NAME HERE” to be submitted for posting on the club information board at ECSU
- Act as an informant between student unions and “CLUB NAME HERE”
- Inform “CLUB NAME HERE” of upcoming events that the club can participate in
- Ensure “CLUB NAME HERE” is following all Club Guidelines with in the Clubs Handbook

Academic Events Coordinator (one position)

- Initiate and organize academic events such as seminars, career days, et cetera
- Reserve rooms required for events
- Work with the St. George Academic Events Coordinator to organize joint events

Social Events Coordinator (one position)

- Initiate and organize social events such as pubs, sports events, et cetera
- Reserve rooms required for events
- Work with the St. George Social Events Coordinator to organize joint events

Marketing Coordinator (one person)

- Creates and organizes the distribution of posters for events
- Ensures that logo for “CLUB NAME HERE” is on all publications generated
- Distributes in class advertising for “CLUB NAME HERE”
- Makes announcements in various UTM mediums (I.E. Newspapers, radio stations, “CLUB NAME HERE” website).

Technical Officer (one person)

- Maintain the website according to University of Toronto guidelines

ARTICLE VI: Procedures

Section 1: Academic Society Town Hall Session

- “CLUB NAME HERE” will make an attempt to host two Town Hall Session meetings during a Fall/Winter academic session to hear the concerns, suggestions or comments by average students.
- “CLUB NAME HERE” will be responsible for facilitating this communication with our members.

Section 2: “CLUB NAME HERE” Executive Meetings

- Shall be open to everyone unless two members of the executive call for an incamera meeting
- Will be a minimum of one hour in length
- Will be announced four days prior
- Shall be held at least once every three weeks
- Can be called by any member of the executive

Section 4: “CLUB NAME HERE” Removal from Office

- Any executive member who fails to attend three consecutive meetings with out reason is removed from their position, unless cause of absence was received prior, at least 24 hours.
- Immediate removal will take place in the event of stealing money from “CLUB NAME HERE” , which includes wrongfully spending the Society’s funds
- Misuse of Society Funds
- Not fulfilling the duties and responsibilities as outlined for the position in this Constitution.
- Sexual Harassment or discrimination on the basis of race, ancestry, place of origin, colour, ethnic origin, citizenship, creed, gender, sexual orientation, handicap, age, family status, and marital status.
- An impeachment vote per the process outlined above must be followed and submitted (originals or copies) to UTMSU
- Anyone removed from the “CLUB NAME HERE” executive cannot run for another position in subsequent years

Section 5: General Membership Meetings

- At least three executive members shall be present
- Held twice during an academic year
- Any vote taken at this time will require over fifty percent majority of the undergraduate geography general membership, present and voting

Section 6: “CLUB NAME HERE” Office Hours

Each executive member shall contribute a minimum of two hours per week at which time he/she shall be available in the “CLUB NAME HERE” office, or failing office availability, check “CLUB NAME HERE” forum frequently and respond to inquiries.

Section 7: Executive Committee Election

Notification of Elections taking place will be given to UTMSU, ASAC, and the UTM Community

- Elections will be held by the second Friday of April.
- Elections are open to all interested candidates that are members of “CLUB NAME HERE”.
- Advertising for elections is mandatory and are to take place over a period of a minimum of one month, and must be visible throughout the campus
- All election advertisements must be submitted for approval and signature to the Clubs Commissioner, and ASAC.
- Elections shall have a CRO (Chief Returning Officer) supervising the electoral process. The CRO must be non-biased and must be approved by the club executive and the Clubs Commissioner.
- A nomination period following the advertising period should be set for a period of at least one week, and will take place during the month allocated to elections.
- A campaign week will be held in the week following nominations close.
- Elections are to take place at a place designated for this purpose by the Clubs Commissioner, and ASAC in the week following campaigning, consisting of a period of three days.
- Two nominations will be required for each executive position
- Elections must be overseen by an independent third party

Section 8: Amendments to the Constitution

- Successful changes to the constitution will require two-thirds of executive support with over fifty percent majority of the general membership, present and voting
- Any amendments will be effective immediately following the meeting
- All amendments will be also given to ASAC for final approval