

# Heart Lake Road Ecology Monitoring Project

## 2025 Report

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## Project Overview

The Heart Lake Road Ecology Monitoring Project (HLREMP) was relaunched in June of 2025 as a collaborative, community-based initiative between the City of Brampton and TRCA, with support from the Heart Lake Turtle Troopers (HLTT), to monitor and enhance turtle nesting sites along a segment of Heart Lake Road in Brampton. This project centers community stewardship and education in efforts to support turtle conservation in the GTA. Volunteers registered and trained by TRCA will work to collect data on turtle observations, nesting sites, and mortality, while taking the appropriate measures to protect identified nesting sites.

Beyond turtle species, the HLREMP collects road mortality data for all wildlife using the monitored segment of Heart Lake Road, including mammals, reptiles and amphibians, and birds, and observations on the integrity of the exclusion fencing, which was installed nine years prior. The results from these observations provide insight into how wildlife interacts with Heart Lake Road, the effectiveness of the exclusionary infrastructure, as well as an update on fence repair needs.

## Project Implementation

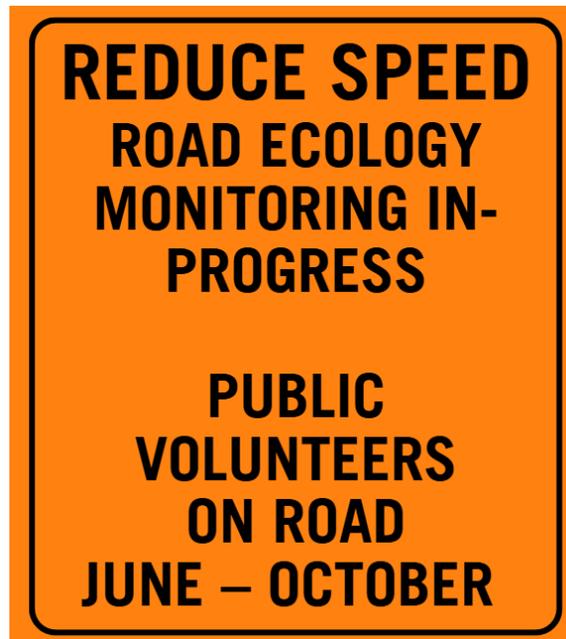
### Exclusion Fence Tagging

In late May, prior to the start of the monitoring program, TRCA staff were accompanied by executive members of the HLTT to attach tag numbers to the exclusion fencing. Every 10<sup>th</sup> fence panel was tagged to establish numbered segments of fence for precise communication. The tags were recorded using a handheld GPS unit and mapped (appendix A) to streamline communication and repairs throughout the monitoring season.

### Speed Reduction Signs

In early June, two signs were installed on Heart Lake Road at Countryside Dr and Sandalwood Pkwy E providing notice to drivers of monitoring activity on the roads (Figure 2). These signs encourage drivers to slow down during the monitoring season when

volunteers would be most active, and also with consideration to the increased wildlife passage and road usage.



*Figure 1 The design for the speed reduction signs installed along Heart Lake Road for the monitoring season.*

## Volunteer Recruitment

Volunteers for the HLREMP were recruited on TRCA's Better Impact volunteer portal. Recruitment for the HLREMP began in May, prior to the initial training session in early June. The opportunity was presented first to the trained Turtle Nest Monitoring volunteers, who previously received training in turtle identification, nest protection, and nest monitoring, all delivered and supported by the HLTT. These trained volunteers comprised the first cohort in June.

Prior to the second round of training in August, the HLREMP opportunity was also made available more generally to the wider TRCA volunteer network through the internal and external opportunity posting on the volunteer portal. The second cohort of volunteers consisted of a mix of trained HLTT volunteers and new volunteers.

## Volunteer Training

Volunteer orientation and training was offered twice to interested volunteers of the HLREMP, the first of which occurred on June 2<sup>nd</sup> and the second on August 15<sup>th</sup>. Over the course of these two training sessions, 27 volunteers were trained in preparation for the HLREMP. Support from senior and executive HLTT members supplemented turtle-specific training and questions regarding nest protector installation and monitoring.

City of Brampton Public Works staff were in attendance to support the delivery of the Safe Work Procedure, and to provide a walk-through of the monitoring route.



*Figure 2 The HLREMP volunteer monitoring route, where the pin at the starting point is the Heart Lake Conservation Park entrance at Heart Lake Road.*

Volunteer orientation provided an overview of pertinent topics to the role, including:

- a. HLREMP volunteer role and responsibilities
- b. Safe Work Procedure
- c. Monitoring protocol, both within and beyond permitted monitoring areas
- d. Protocol for managing road mortalities
- e. Protocol for reporting precarious turtle nests
- f. Survey123 training for data entry
- g. Tour of the HLREMP storage box

#### h. Monitoring route walk-through

The training materials are outlined in detail in Appendix B.

## Methods

### South Heart Lake Road, Countryside Drive to Sandalwood Parkway E

Volunteer monitoring shifts for the HLREMP Road began on June 2<sup>nd</sup> and ended on November 14<sup>th</sup> and were scheduled weekly, except during the modified construction schedule. Volunteers registered for their respective shifts on the Better Impact volunteer portal, managed by TRCA volunteer administrators. For safety and fair task distribution, a minimum of two volunteers were required per shift, with a maximum allowance of four volunteers. On the regular schedule, volunteers monitored Heart Lake Road from Countryside Drive to Sandalwood Parkway E thrice weekly from 9am-11am, with the accompaniment of City of Brampton Public Works staff. As a preventative measure and additional safety precaution, City of Brampton staff parked vehicles with hazard lights on Heart Lake Road at Countryside Dr and Sandalwood Pkwy E to alert oncoming traffic of road activity. Public Works staff walked with the volunteers for the entire monitoring route, with one staff member leading and the second staff member following behind the volunteers.

Volunteers began their shifts by loading all required materials from the HLREMP storage box into a provided trolley and meeting Public Works staff at the entrance of Heart Lake Conservation Park. Volunteers and Public Works staff walked the same monitoring route (Figure 3) every shift, beginning and ending at the park entrance.

During a monitoring shift, volunteers would record any observations, including road mortalities, live wildlife observations, turtle nests, evidence of hatchlings or predated eggs, and exclusion fencing damage on the Survey123 application. Survey123 is a desktop and mobile application powered by ESRI used to record and track observations for the HLREMP. An existing survey from the grandfathered HLREMP was reintroduced for the 2025 monitoring season.

Following each shift, volunteers would perform a 15-minute traffic count from the safety of their vehicles or the park entrance. Assisted by an analog tally counter, volunteers would count each vehicle passing the Heart Lake Conservation Park entrance within the survey period. Observations and the final tally were recorded in Survey123 at the end of each

monitoring shift. The traffic count provides additional information on the use of Heart Lake Road.

## North Heart Lake Road, Countryside Drive to Mayfield Road

Monitoring of Heart Lake Road from Countryside Drive to Mayfield Road was conducted by TRCA staff twice a month on Friday mornings, beginning on June 30<sup>th</sup> and ending on November 14<sup>th</sup>. Staff traveled by vehicle on Heart Lake Road from Countryside Drive north to Mayfield Road, and back south to Countryside Drive (Figure 4). One staff member walked with high-visibility clothing for stretches of the road where shoulders were wide enough to allow for a safe buffer from traffic.

All observations were recorded on the Survey123 application. Exclusion fencing has not been installed on this northern stretch of Heart Lake Road, and thus fence damage was not included in the monitoring protocol.



Figure 3 The HLREMP monitoring route for the northern segment of Heart Lake Road, from Countryside Dr to Mayfield Rd.

Following each shift, TRCA staff would perform a 15-minute traffic count from the safety of their vehicles or the park entrance. Assisted by an analog tally counter, staff would count each vehicle passing the Heart Lake Conservation Park entrance within the survey period. Observations and the final tally were recorded in Survey123 at the end of each monitoring shift.

## Protocol for Reporting Exclusion Fence Damage

Reports of damage to the existing exclusion fencing were submitted by volunteers on the Survey123 platform. In reference to the fence tags (Appendix A), volunteers would record the nearest tag number, the number of panels damaged, and a description of the damage. TRCA staff would summarize these results and communicate them to City of Brampton staff to facilitate repair.

## Results

### Wildlife Observations

A total of 147 wildlife observations were recorded throughout the monitoring season, including both live and deceased. Most observations were recorded to the familial level, with some identifications down to species. The total observations include both live and deceased wildlife recorded by volunteers and TRCA staff. All recorded observations are detailed in Appendix C and mapped in Appendix D.

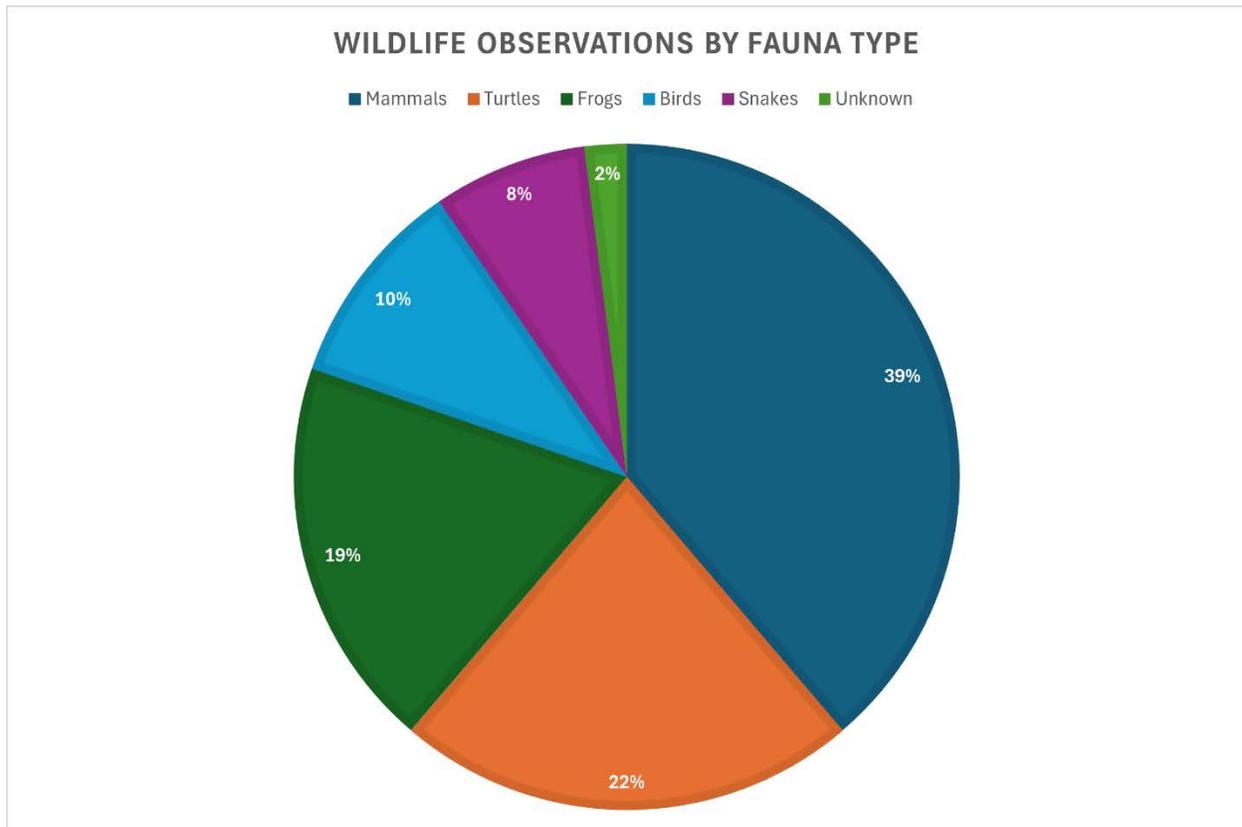


Figure 4 All wildlife observations by fauna type, as observed by monitoring volunteers and TRCA staff.

The wildlife observations by fauna type are summarized in Figure 5. Mammals were amongst the most reported fauna type along both monitoring segments of Heart Lake Road. The most recorded mammal species, both alive and dead, was the Gray Squirrel (*Sciurus carolinensis*).

Turtles were the second highest recorded fauna type. Nearly half of the observed turtles (48%) were found deceased on the road or on the shoulder. All Midland Painted Turtles (*Chrysemys picta*) recorded as alive were observed off-road, beyond the exclusion fencing and in the surrounding wetlands. Figure 6 summarizes all recorded turtle observations by species. Of the recorded observations, 6% were hatchlings, 18% were juveniles, 54% were adults, and 21% were unknown.

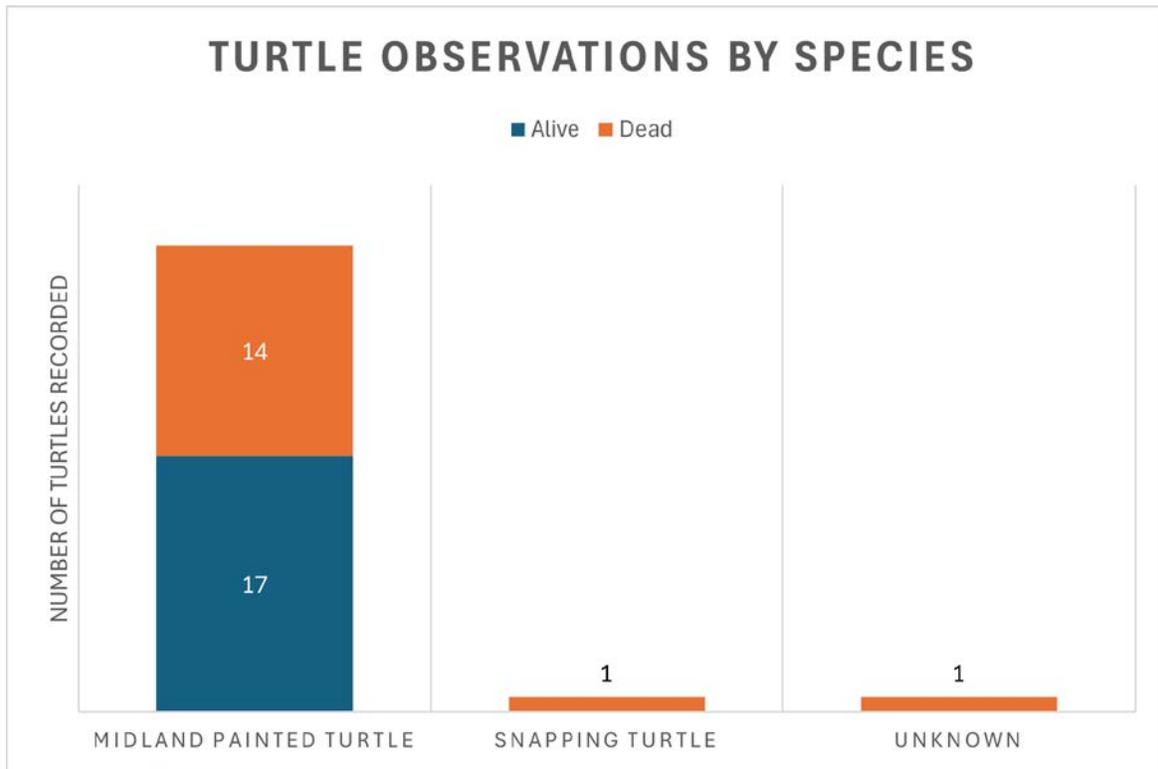


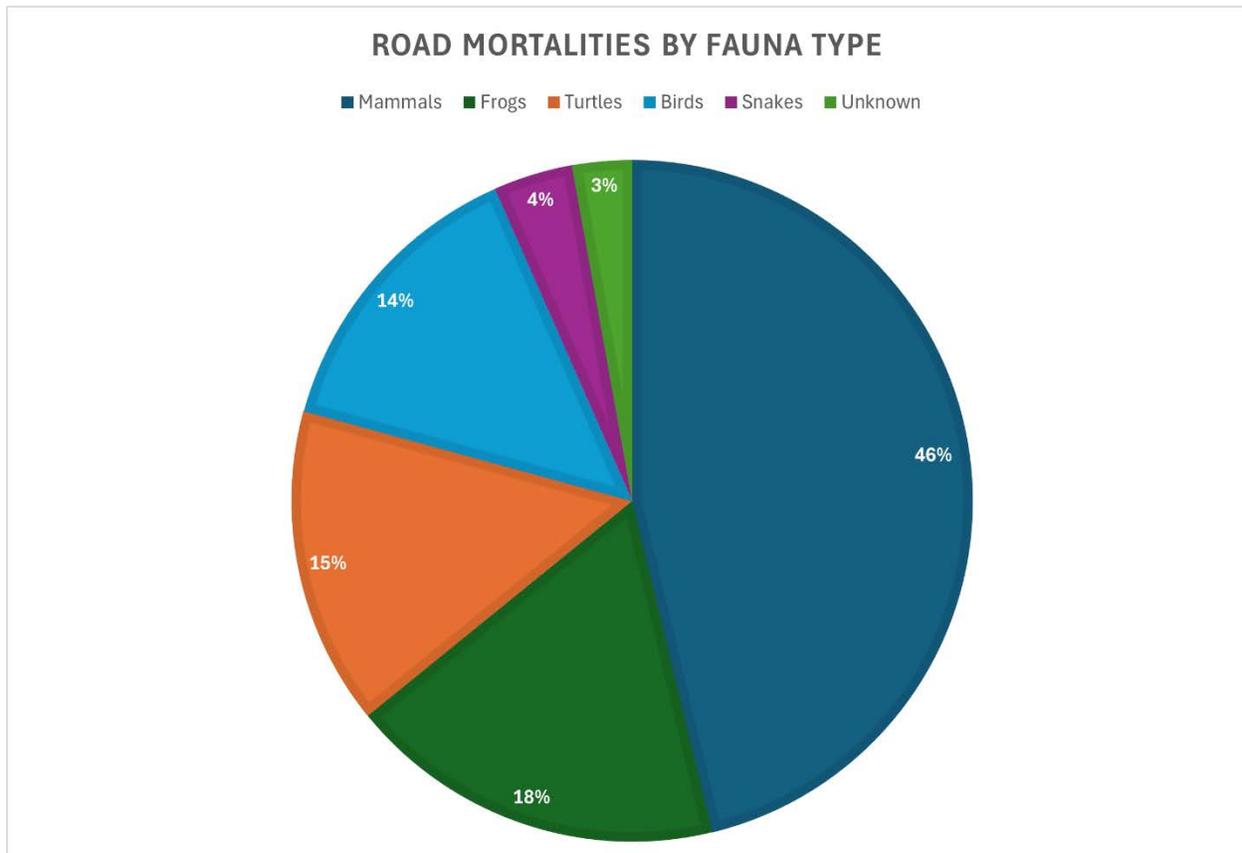
Figure 5 The number of recorded turtle observations by species.

## Wildlife Vehicle Collisions

Mortalities caused by Wildlife Vehicle Collisions (WVCs) dominated the observations collected by both volunteers and TRCA staff. A total of 106 mortalities were reported, with mammals being the most impacted by WVCs (Figure 7). Species identification of WVCs was less certain or reliable, depending on the severity of the collision or the duration of time between collision and observation. Of the mammal mortalities, 21% were labelled as unknown, due to the severity of the collisions, predation or time elapsed since the collision occurred. Despite this, mammal mortalities proved to be the easiest to identify, as they remained intact for longer than their herpetofauna or ornitofauna counterparts. Gray Squirrels (*Sciurus carolinensis*) were amongst the highest reported mortalities (24.5%).

Frog, toad, and snake mortalities proved to be challenging to identify, depending on the time elapsed since the collision. These animals would quickly become desiccated,

especially in the warmer months of the season, making them difficult to identify with certainty down to the species level.



*Figure 6 Percentage of Wildlife Vehicle Collision mortalities by fauna type, as observed by monitoring volunteers and TRCA staff.*

## Turtle Nests

Two turtle nests were recorded on November 7<sup>th</sup> on the eastern side of Heart Lake Road, less than 30 meters north of Highway 410. Both nests had been constructed off road, behind the exclusionary fencing. This particular area borders a wetland. The nests were found to be predated, with a hole dug at each nest and fragments of eggs scattered (Figure 8).



*Figure 7 Predated turtle nest observed on South Heart Lake Road monitoring route.*

## Traffic

The results from traffic counts completed during this project are summarized in Figure 9. The highest number of vehicles was observed in the month of July, with a total of 1,176 recorded. Total traffic counts plateaued between the months of August and November, with the limitations imposed by the construction along Heart Lake Road. Traffic counts remained a component of the monitoring shift; however, fewer shifts were delivered at this time, and traffic was bottlenecked with the reduction of the road to one lane for both directions of traffic. Despite construction complications, an average of 143 vehicles per

15-minute count was observed. Further monitoring would be required to provide greater insight into the use of Heart Lake Road.

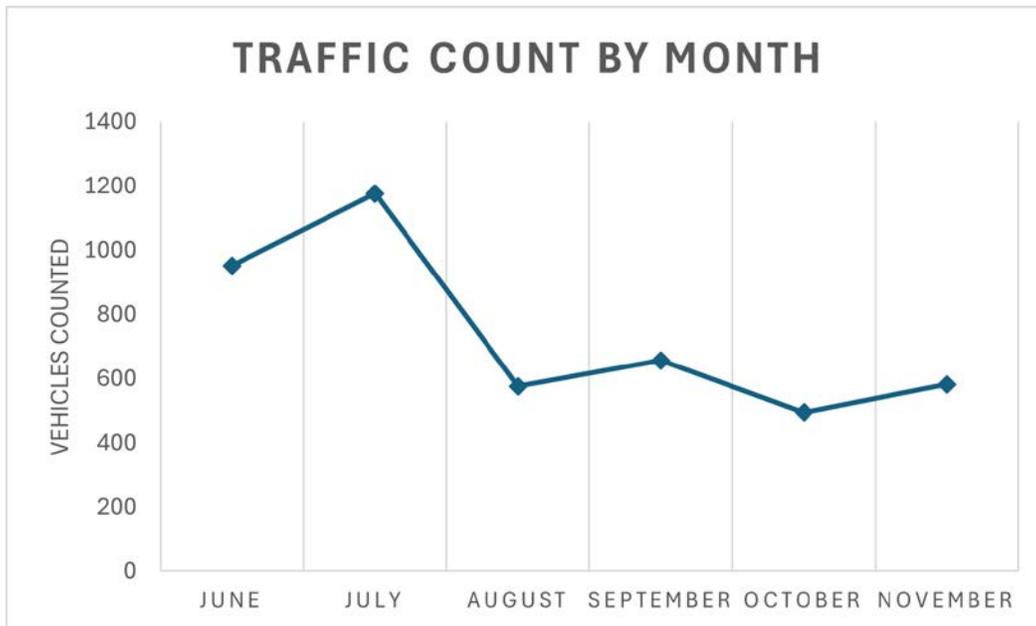


Figure 8 Vehicles counted within a 15-minute time period throughout the monitoring season.

## Exclusion Fence Repairs

Repairs to the exclusion fencing were completed by City of Brampton staff on 2 separate occasions during the project. The first round of repairs was completed on July 23<sup>rd</sup>, and included patching damaged sections of fence, using gravel to fill gaps between the fence and ground caused by wash out, and extending the exclusion fencing another 30ft towards Sandalwood Pkwy E. The second request for repairs was submitted in late August, however due to construction on the road, City of Brampton staff could not safely access the road or fencing to complete the repairs. Once construction had concluded and more fence damage data had been collected by volunteers, the second round of repairs was completed by City of Brampton staff on November 4<sup>th</sup>.

## Study Challenges and Limitations

### Street Sweeping

On June 4<sup>th</sup>, TRCA staff were informed about a street sweeping vehicle clearing the monitoring route on Heart Lake Road. Concerns were raised about the quality of data that would result during this disruption, and TRCA staff worked with City of Brampton staff to find a solution. The schedule of the street sweeper was quickly adjusted to avoid the 9am-11am monitoring shifts; however, this practice was still mandated by nearby development and occurred outside of the volunteer shifts.

While the schedule was adjusted to accommodate monitoring, street sweeping may still have influenced the quality of data captured throughout the monitoring season in ways that were not measured by the HLREMP. Street sweeping may have removed evidence of wildlife vehicle collisions, and as a result, those potential WVC's could not be recorded.

### Heart Lake Road Construction

Construction on Heart Lake Road began in early August and affected the southern monitoring route, between Countryside Dr and the Heart Lake Conservation Park entrance. In response to the construction, the volunteer monitoring schedule pivoted for the safety of volunteers and the limited access to the road. Throughout most of the month of August and the entirety of September and October, HLREMP volunteer monitoring shifts were held exclusively on Sundays from 9:30am-11:30am. Weekday monitoring shifts did not resume until the final week of the field season on Monday, November 3<sup>rd</sup>.

The construction work altered the flow of traffic and reducing the frequency of monitoring shifts. For much of the construction duration, Heart Lake Road was reduced to one lane, which resulted in significantly lower traffic counts. With the reduction of traffic and loss of 66% of volunteer shifts, fewer road mortalities and wildlife observations were collected.

The available data does not allow us to determine whether the observed reductions in mortality rates resulted from decreased traffic volumes or from the reduced number of monitoring shifts, which substantially limited our ability to document mortalities. In

addition, the frequency of street sweeping conducted during the construction period remains unknown and may represent an additional source of uncertainty.

## Exclusion Fence Integrity

The age and integrity of the existing exclusion fencing was a challenge during the monitoring season. Reports of fencing damage received from volunteers were compiled throughout the monitoring season and communicated to City of Brampton staff for repair. While repairs along the southern stretch of fencing were completed on two separate occasions, all repairs were halted during the period of road construction, as the fence could not be accessed. During these three months, which coincided with the critical timing when many hatchlings are emerging, the integrity of the exclusion fencing was impacted at numerous sections along the monitoring route. Some of the most frequently reported damage resulted from washout following rain events, which created gaps between the gravel and the base of the fencing. Wildlife had numerous opportunities to access the road during the period of construction.

Independent of the construction activities, the fencing exhibited clear signs of wear and deterioration along the entire monitoring route. There are many segments of fence that have lost the required overhang, allowing wildlife to easier access to the road. Vegetation overgrowth along the exclusion fencing, especially near Countryside Dr, is allowing wildlife to easier access over the fencing. Numerous sections also contain temporary repairs that are deteriorating or failing. Substantial portions of the exclusion fencing require maintenance to remain functional and provide effective protection for wildlife.

## Recommendations

### Earlier Start in Monitoring Season

To support volunteer engagement and minimize the interval between recruitment and monitoring activities, we recommend beginning the monitoring season in April, rather than June. Volunteer interest typically increases in late winter and early spring, with the beginning of our field season. Aligning the project start date with this period will reduce the delay between recruitment and orientation, thereby helping to sustain volunteer interest and build momentum.

Given the heightened turtle activity in April and May, establishing routine monitoring during this period is essential for documenting turtle nesting observations and implementing appropriate protection measures. Additionally, because monitoring and maintenance activities are limited during the winter months, early spring monitoring would facilitate the identification necessary repairs in the exclusion fence, reducing risks to sensitive fauna.

## Exclusion Fence Upgrades

Although fence repairs were implemented on 2 separate occasions during the 2025 monitoring season, the age and integrity of the existing exclusion fence is a concern for the wildlife using Heart Lake Road. Nearly 10 years after installation, the fence is deteriorating at numerous points throughout the extent.

To better protect wildlife and encourage the use of the wildlife passages, new exclusion fencing is strongly recommended. In its current condition, there are numerous state-of-good-repair issues, including holes that need patching, gravel washouts at the base of the fence, missing overhangs that require replacement, and entire sections of fencing that are absent. Additionally, routine maintenance is recommended along areas adjacent to the fencing to control vegetation growth along the exclusion fencing panels, preventing it from creating a natural bridge that would allow wildlife to bypass the fence and access the road.

With the complications caused by construction, there were significant delays in completing the second round of repairs due to the inability of staff to access the exclusion fence. Timely repairs are essential in maintaining an effective barrier for wildlife and mitigating WVCs, particularly during key migratory periods where fauna is more active and vulnerable.

Regular maintenance and permanent, more structurally sound solutions are recommended to effectively protect wildlife and keep them off the road.

## Illegal Dumping and Litter Management

The accumulation of litter and evidence of illegal dumping was identified by volunteers, but especially by TRCA staff monitoring the northern stretch of Heart Lake Road, between Countryside Dr to Mayfield Rd. Both volunteers and TRCA staff collected litter during monitoring, using the provided latex gloves, garbage bags, and garbage pickers. Some

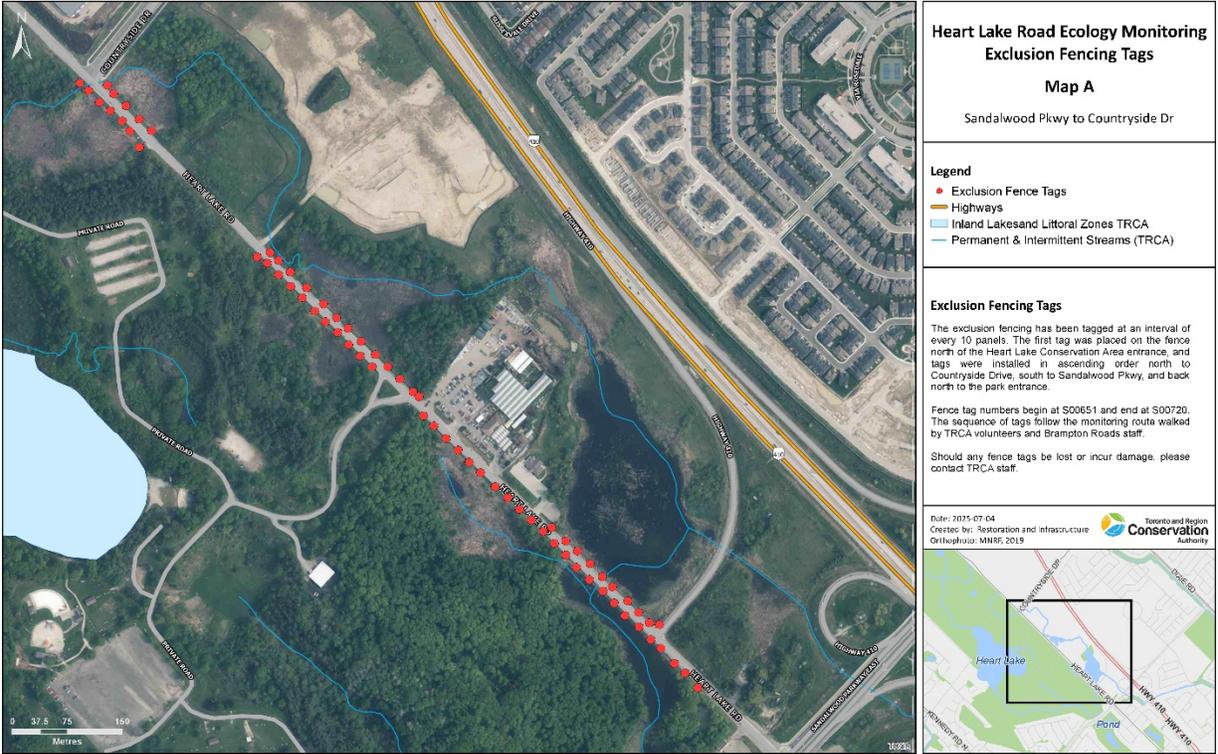
instances of illegal dumping were too large, heavy, or precarious to remove, such as tires, vehicle bumpers, mattresses, bedsprings, and other disposed furniture. To discourage illegal dumping and mitigate the movement of litter into natural spaces, we recommend the installation of panel fencing or barriers (i.e., fencing structures, densely planted shrubs, thorny shrubs) and regular maintenance.

## Conclusions

The reintroduction of the HLREMP collected preliminary data for future comparison and fostered a sense of care and collective action in volunteers who gained exposure and knowledge to the threats concerning wildlife on Heart Lake Road. The results from the 2025 monitoring program help to demonstrate opportunities to replace and remove current WVC mitigation measures.

Extending the Road Ecology Monitoring Program in 2026 will help to expand current monitoring efforts, support the improvement and expansion of exclusionary infrastructure, engage the public in local and pertinent volunteer initiatives, and contribute to wildlife conservation in the City of Brampton.

# Appendix A



Disclaimer: The data used to create this map was compiled from a variety of sources & dates. The TRCA takes no responsibility for errors or omissions in the data and retains the right to make changes & corrections at anytime without notice. For further information about the data on this map, please contact the TRCA Restoration and Infrastructure Division, (416) 651-6000. May not be reproduced without permission. This is not a plan of survey. Produced by Toronto and Region Conservation Authority under licence with the Ministry of Natural Resources & Forestry. © Queen's Printer for Ontario.



**Heart Lake Road Ecology Monitoring  
Exclusion Fencing Tags**

**Map B**

S00662-S00672

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**Legend**

- Exclusion Fence Tags
- Highways
- Inland Lakes and Littoral Zones TRCA
- Permanent & Intermittent Streams (TRCA)

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**Exclusion Fencing Tags**

The exclusion fencing has been tagged at an interval of every 10 panels. The first tag was placed on the fence north of the Heart Lake Conservation Area entrance, and tags were installed in ascending order north to Countryside Drive, south to Sandalwood Pkwy, and back north to the park entrance.

Fence tag numbers begin at S00651 and end at S00720. The sequence of tags follow the monitoring route walked by TRCA volunteers and Brampton Roads staff.

Should any fence tags be lost or incur damage, please contact TRCA staff.

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Date: 2015-07-04  
Created by: Restoration and Infrastructure Orthophoto, MNR, 2015



Toronto and Region  
**Conservation**  
Authority

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**Heart Lake Road Ecology Monitoring  
Exclusion Fencing Tags**

**Map C**

S00651-S00661; S00674-S00686

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**Legend**

- Exclusion Fence Tags
- Highways
- Inland Lakes and Littoral Zones TRCA
- Permanent & Intermittent Streams (TRCA)

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**Exclusion Fencing Tags**

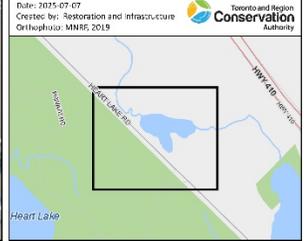
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Date: 2015-07-07  
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Toronto and Region  
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**Heart Lake Road Ecology Monitoring Exclusion Fencing Tags**

**Map D**

S00687-S00692; S00705-S00720

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**Legend**

- Exclusion Fence Tags
- Highways
- Inland Lakes and Littoral Zones TRCA
- Permanent & Intermittent Streams (TRCA)

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Date: 2025-07-07  
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**Heart Lake Road Ecology Monitoring Exclusion Fencing Tags**

**Map E**

S00693-S00704

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**Legend**

- Exclusion Fence Tags
- Highways
- Inland Lakes and Littoral Zones TRCA
- Permanent & Intermittent Streams (TRCA)

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## Appendix B

### Overview of Volunteer Role

<b>Description of Role</b>	Volunteering for this opportunity, you will play a critical role in collecting data on wildlife sightings and install nest protectors as required along Heart Lake Road to protect turtle nests. Purpose is to collect data on wildlife sightings, road mortalities, and road usage to understand the use and impact of the road on wildlife and help support future protection measures.
<b>Monitoring Season</b>	April to November
<b>Monitoring Schedule</b>	Monday, Wednesday, Friday from 9am-11am Temporarily Sundays from 9am-11am while construction is occurring
<b>Volunteer Tasks</b>	<ul style="list-style-type: none"> <li>• Collect data on collisions/mortality rates of wildlife along Heart Lake Road.</li> <li>• Remove, if safe to do so, any deceased turtles and smaller wildlife from Heart Lake Road.</li> <li>• Identify and report structural issues with existing wildlife fencing.</li> <li>• Search for turtles and nesting activity.</li> <li>• Install nest protectors on observed or suspected nesting sites in permitted areas.</li> <li>• Record observations using Survey 123 app</li> </ul>

### Safe Work Procedure

#### Equipment

All personal protective equipment must be inspected before use, to ensure it is in safe working condition. All equipment must be worn and used as per the manufacturer's recommendations and without modification.

#### Personal Protective Equipment Requirements:

1. High visibility class 2 safety vest
2. Nitrile gloves
3. Hand sanitizer
4. First aid kit including tick removal kit
5. Working cell phone (minimum 1 per group)

**Be prepared for the conditions with:**

1. Sunscreen (in storage box)
2. Bug spray containing deet (in storage box)
3. Extra clothing layers
4. Extra drinking water

**1. Pre-monitoring Set-up**

- a. Ensure monitoring of Heart Lake Road occurs only during the approved shifts of 9 am – 11 am with City of Brampton Public Works staff present.
- b. Observe weather conditions. Refrain from monitoring if there is rain, thunder and/or high winds or where weather conditions inhibit safety while on or near the roads. You will be notified by email if shifts have been cancelled for this reason.
- c. Park vehicles at designated parking area.
- d. Review all personal protective equipment and ensure that you have all items on the Personal Protective Equipment Requirements list.
- e. Identify roles for the shift: Volunteer A, Volunteer B, Volunteer C

Role	Responsibility
A (Spotter and safety set up)	<ul style="list-style-type: none"> <li>• Observes oncoming traffic in both directions at all times.</li> <li>• Observes oncoming traffic (work side) during removal.</li> </ul>

	<ul style="list-style-type: none"> <li>• Communicates potential hazards to team.</li> <li>• Shifts safety set-up as required.</li> <li>• Activates 911 if necessary.</li> </ul>
B (Data Collection)	<ul style="list-style-type: none"> <li>• Collects data</li> <li>• Observes for wildlife on roadway</li> <li>• Communicates potential hazards to team</li> </ul>
C (Support)	<ul style="list-style-type: none"> <li>• Observes for wildlife on shoulder</li> <li>• Observes oncoming traffic (opposite work side) during removal</li> <li>• Assists with data collection at roadside</li> <li>• Communicates potential hazards to team</li> </ul>

## 2. Road Monitoring Procedure

- a. City of Brampton Public Works staff to set up ‘men at work’ roadside signs.
- b. Carry a copy of the Road Occupancy Permit for your site at all times while on site.
- c. Walk on shoulder facing on-coming traffic, following the route identified in the site fact sheets.
- d. Volunteer B (Data Collector) to only remove wildlife (dead or alive) when City of Brampton Public Works staff deem it is safe to do so. Volunteers are not authorized to stop or direct traffic.
- e. Avoid all visual and auditory distractions throughout shift such as wearing ear buds, texting, phone calls, etc.
- f. Carry a charged cell phone (minimum 1 per group).
- g. Not eat during surveys.
- h. Wear nitrile gloves when handling wildlife.
- i. Use hand sanitizer at the end of the survey and before eating.

## 3. Close Out Procedure

- a. Upload data at secure Wi-Fi location.

- b. Record volunteer hours worked on the volunteer Better Impact Volunteer website

## Monitoring Protocol for Observations Beyond Permitted Areas

If nests, wildlife, or any other monitoring related concerns are observed beyond the boundaries of approved monitoring sites, volunteers should:

- Remain in the permitted monitoring area. Do not investigate sites beyond approved monitoring sites.
- Do not install nest protectors on any nests outside of the permitted areas.
- Notify TRCA staff members of the observation. TRCA staff will notify parks staff of the concern.

## Protocol for Managing Road Mortalities

When volunteers encounter road mortalities of wildlife turtle-sized or smaller, they should:

- Allow City of Brampton Public Works staff to assess road conditions for safe crossing conditions.
- Ensure proper high-visibility clothing and PPE is being used/worn at all times.
- Volunteer B (Data Collector) to only remove roadkill from the shoulders of the road. Volunteers are not authorized to stop or direct traffic.
- Volunteers are not to remove roadkill from the road. Please record the finding and do your best to identify what it is and enter into Survey 123.
- All materials must be sterilized after removing roadkill and hands must be sanitized.

When volunteers encounter road mortalities of wildlife larger than turtle-sized, they should:

- Contact Brampton Animal Services to request removal of the animal:  
Phone: 905-458-5800  
Email: [animal.Services@brampton.ca](mailto:animal.Services@brampton.ca).

## Protocol for Precarious Turtle Nests

1. If a nest in a precarious spot (i.e. on the road, shoulder, etc.) is identified, notify the Heart Lake Turtle Troopers.
2. It is illegal to excavate or move a turtle nest without the necessary permits.

3. Do not place a nest protector on the road, shoulder, parking lot, or anything of this sort.

## Appendix C

### Bird Observations

Observer	Date	Status	Number Recorded	Location	Species	Latitude	Longitude
volunteer	2025-06-02	Dead	1	OffRoad	Unknown	43.741322	-79.787431
volunteer	2025-06-04	Dead	1	OnRoad	Downy Woodpecker	43.738285	-79.783217
volunteer	2025-06-09	Dead	1	OnRoad	Unknown	43.73812	-79.783032
volunteer	2025-06-11	Dead	1	OnRoad	Unknown	43.730473	-79.772717
volunteer	2025-06-13	Dead	1	OffRoad	Unknown	43.744169	-79.791694
volunteer	2025-06-18	Dead	1	OnRoad	Unknown	43.73806	-79.783186
volunteer	2025-06-30	Dead	1	OffRoad	European Starling	43.740699	-79.787254
staff	2025-06-30	Dead	1	OnRoad	Unknown	43.746626	-79.794688
volunteer	2025-07-07	Dead	1	OnRoad	Unknown	43.744469	-79.791924
volunteer	2025-08-24	Dead	1	OnRoad	Unknown	43.738337	-79.782492
staff	2025-08-29	Dead	1	OnRoad	Grey Catbird	43.746611	-79.794577
staff	2025-10-09	Dead	1	OnRoad	Grey Catbird	43.74694	-79.795128
volunteer	2025-11-05	Dead	1	OnRoad	Black-Capped Chickadee	43.744644	-79.791916
staff	2025-11-07	Dead	1	OnRoad	Northern Cardinal	43.741891	-79.788229
staff	2025-11-14	Dead	1	OnRoad	Unknown	43.738881	-79.784225

### Frog and Toad Observations

Observer	Date	Status	Number Recorded	Location	Species	Latitude	Longitude
volunteer	2025-06-04	Dead	1	OnRoad	Unknown	43.741444	-79.787837
volunteer	2025-06-04	Dead	1	OnRoad	Unknown	43.741976	-79.788603
volunteer	2025-06-04	Dead	1	OnRoad	Unknown	43.742166	-79.788884
volunteer	2025-06-06	Dead	1	OnRoad	Unknown	43.740015	-79.787933
volunteer	2025-06-06	Dead	1	OnRoad	Unknown	43.74004	-79.785197
volunteer	2025-06-11	Dead	1	OnRoad	Unknown	43.741544	-79.787962
volunteer	2025-06-18	Dead	1	OnRoad	Unknown	43.741406	-79.787763
volunteer	2025-07-14	Dead	2	OffRoad	Unknown	43.743592	-79.790561
volunteer	2025-07-16	Dead	1	OffRoad	Leopard Frog	43.737935	-79.783056

volunteer	2025-07-23	Dead	1	OnRoad	Unknown	43.740841	-79.787437
volunteer	2025-08-17	Alive	2	OnRoad	Unknown	43.74331	-79.790187
volunteer	2025-08-17	Alive	5	OnRoad	Unknown	43.737971	-79.782858
volunteer	2025-08-17	Alive	1	OnRoad	Green Frog	43.737837	-79.782728
volunteer	2025-08-17	Dead	1	OnRoad	Unknown	43.740655	-79.786721
volunteer	2025-08-24	Dead	1	OnRoad	Leopard Frog	43.744567	-79.792047
volunteer	2025-08-24	Dead	1	OnRoad	Unknown	43.738301	-79.782514
volunteer	2025-08-24	Dead	1	OnRoad	Unknown	43.738393	-79.782407
volunteer	2025-08-24	Dead	1	OnRoad	Unknown	43.738235	-79.782596
volunteer	2025-08-24	Dead	1	OnRoad	Unknown	43.737626	-79.782582
volunteer	2025-08-24	Dead	1	OnRoad	Unknown	43.740879	-79.787358
volunteer	2025-09-07	Alive	1	OffRoad	Leopard Frog	43.744261	-79.791657
volunteer	2025-09-07	Dead	1	OnRoad	Unknown	43.739629	-79.78843

## Mammal Observations

Observer	Date	Status	Number Recorded	Location	Species	Latitude	Longitude
volunteer	2025-06-02	Dead	1	OnRoad	Meadow Vole	43.741967	-79.788585
volunteer	2025-06-02	Dead	1	OffRoad	Deer Mouse	43.742493	-79.789224
volunteer	2025-06-03	Alive	1	OffRoad	White Tailed Deer	43.746915	-79.79507
volunteer	2025-06-04	Dead	2	OnRoad	Unknown	43.741563	-79.788026
volunteer	2025-06-04	Dead	1		Unknown	43.741794	-79.788364
volunteer	2025-06-04	Dead	1	OnRoad	Unknown	43.737456	-79.782181
volunteer	2025-06-04	Alive	1	OnRoad	Gray Squirrel	43.741578	-79.787782
volunteer	2025-06-04	Dead	1	OnRoad	Raccoon	43.746924	-79.79472
volunteer	2025-06-09	Alive	1	OnRoad	Coyote	43.741326	-79.787662
volunteer	2025-06-09	Dead	1	OnRoad	Unknown	43.744289	-79.791431
volunteer	2025-06-09	Dead	1	OnRoad	Gray Squirrel	43.743076	-79.789838
volunteer	2025-06-11	Dead	1	OnRoad	Unknown	43.742499	-79.789115
volunteer	2025-06-11	Alive	1	OnRoad	Gray Squirrel	43.7417	-79.788006
volunteer	2025-06-13	Dead	1	OnRoad	Gray Squirrel	43.740681	-79.785985
volunteer	2025-06-13	Dead	1	OnRoad	Raccoon	43.745468	-79.79286
volunteer	2025-06-13	Dead	1	OnRoad	Gray Squirrel	43.746089	-79.791475
volunteer	2025-06-18	Dead	1	OnRoad	Eastern Chipmunk	43.743364	-79.790451

volunteer	2025-06-18	Dead	1	OnRoad	Unknown	43.742454	-79.789169
volunteer	2025-06-18	Dead	1	OnRoad	Gray Squirrel	43.743857	-79.791071
volunteer	2025-06-23	Dead	1		Unknown	43.743488	-79.790586
volunteer	2025-06-23	Dead	1	OnRoad	Eastern Chipmunk	43.743824	-79.790872
volunteer	2025-06-27	Dead	1	OffRoad	Gray Squirrel	43.741826	-79.788423
staff	2025-06-30	Dead	1	OnRoad	Unknown	43.746616	-79.794662
staff	2025-06-30	Dead	1	OnRoad	Unknown	43.75037	-79.799987
volunteer	2025-06-30	Dead	1	OffRoad	Deer Mouse	43.744058	-79.791198
volunteer	2025-06-30	Dead	1	OnRoad	Unknown	43.740708	-79.786833
volunteer	2025-07-02	Dead	1	OnRoad	Unknown	43.742605	-79.789199
volunteer	2025-07-04	Dead	1	OffRoad	Raccoon	43.742188	-79.7889
volunteer	2025-07-07	Dead	1	OnRoad	Eastern Chipmunk	43.742383	-79.789002
volunteer	2025-07-09	Dead	1	OnRoad	Gray Squirrel	43.741006	-79.78738
volunteer	2025-07-09	Alive	1	OffRoad	Deer Mouse	43.738734	-79.784165
volunteer	2025-07-16	Dead	1	OffRoad	Eastern Cottontail	43.741585	-79.788048
staff	2025-07-18	Dead	1	OnRoad	Unknown	43.746604	-79.794679
staff	2025-07-18	Dead	1	OnRoad	Virginia Opossum	43.749918	-79.799313
volunteer	2025-07-23	Dead	1	OnRoad	Unknown	43.73868	-79.784005
staff	2025-08-01	Dead	1	OnRoad	Virginia Opossum	43.741031	-79.787141
volunteer	2025-08-17	Dead	1	OnRoad	Raccoon	43.743738	-79.790779
volunteer	2025-08-17	Dead	1	OnRoad	Striped Skunk	43.74095	-79.787008
volunteer	2025-08-24	Alive	1	OnRoad	Gray Squirrel	43.739174	-79.784521
staff	2025-08-29	Dead	2	OnRoad	Eastern Cottontail	43.74647	-79.794627
volunteer	2025-09-07	Dead	1	OffRoad	Unknown	43.743721	-79.790753
staff	2025-09-11	Dead	1	OffRoad	Eastern Cottontail	43.746099	-79.793956
volunteer	2025-09-21	Dead	1	OffRoad	Striped Skunk	43.733977	-79.824956
volunteer	2025-09-21	Dead	1	OnRoad	Gray Squirrel	43.762465	-79.792699
volunteer	2025-10-19	Dead	1	OffRoad	Gray Squirrel	43.744164	-79.791309
volunteer	2025-10-26	Alive	1	OnRoad	Gray Squirrel	43.740953	-79.787201
volunteer	2025-10-26	Dead	1	OnRoad	Meadow Vole	43.737758	-79.782983
volunteer	2025-11-05	Dead	1	OnRoad	Gray Squirrel	43.740894	-79.786889
volunteer	2025-11-07	Dead	1	OnRoad	Deer Mouse	43.742584	-79.789371
volunteer	2025-11-07	Alive	1	OnRoad	Gray Squirrel	43.737768	-79.782569

staff	2025-11-14	Dead	1	OnRoad	Raccoon	43.750721	-79.800371
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## Snake Observations

Observer	Date	Status	Number Recorded	Location	Species	Latitude	Longitude
volunteer	2025-06-09	Alive	1	OnRoad	Eastern Garter Snake	43.741396	-79.787838
volunteer	2025-06-13	Alive	1	OnRoad	Eastern Garter Snake	43.738101	-79.782777
volunteer	2025-06-18	Alive	1	OffRoad	Eastern Garter Snake	43.741608	-79.788054
volunteer	2025-06-23	Dead	1	OnRoad	Unknown	43.743763	-79.790803
volunteer	2025-06-27	Alive	1	OffRoad	Eastern Garter Snake	43.740847	-79.787321
volunteer	2025-07-09	Dead	1	OffRoad	Unknown	43.739175	-79.784711
staff	2025-08-01	Alive	1	OnRoad	Eastern Garter Snake	43.74145	-79.787876
staff	2025-08-01	Dead	1	OnRoad	Eastern Garter Snake	43.743779	-79.790821
volunteer	2025-08-17	Alive	1	OnRoad	Eastern Garter Snake	43.737985	-79.783049
volunteer	2025-08-17	Dead	1	OnRoad	Unknown	43.739091	-79.784534
volunteer	2025-08-17	Alive	1	OnRoad	Eastern Garter Snake	43.739972	-79.785889

## Turtle Observations

Observer	Date	Status	Number Recorded	Location	Species	Latitude	Longitude
volunteer	2025-06-02	Alive	3	InsideFence	Midland Painted Turtle	43.738605	-79.783955
volunteer	2025-06-04	Alive	5	OffRoad	Midland Painted Turtle	43.743133	-79.796412
volunteer	2025-06-11	Alive	4	InsideFence	Midland Painted Turtle	43.738605	-79.783962
volunteer	2025-06-11	Alive	1	OnRoad	Midland Painted Turtle	43.741333	-79.787456
volunteer	2025-06-18	Alive	4	InsideFence	Midland Painted Turtle	43.738647	-79.783991
volunteer	2025-06-30	Dead	1	OffRoad	Midland Painted Turtle	43.741245	-79.787584
volunteer	2025-07-02	Dead	1	OffRoad	Midland Painted Turtle	43.739743	-79.785551

volunteer	2025-07-16	Dead	1	OffRoad	Snapping Turtle	43.742743	-79.789625
volunteer	2025-07-23	Dead	1	OffRoad	Midland Painted Turtle	43.741956	-79.788492
volunteer	2025-07-23	Dead	1	OffRoad	Midland Painted Turtle	43.743717	-79.79073
volunteer	2025-07-30	Dead	1	OffRoad	Midland Painted Turtle	43.741927	-79.788517
volunteer	2025-07-30	Dead	1	OffRoad	Midland Painted Turtle	43.743115	-79.789929
volunteer	2025-07-30	Dead	1	OffRoad	Midland Painted Turtle	43.742789	-79.789506
volunteer	2025-08-17	Dead	1	OnRoad	Midland Painted Turtle	43.742827	-79.789549
volunteer	2025-08-17	Dead	1	OnRoad	Midland Painted Turtle	43.738103	-79.78281
volunteer	2025-08-17	Dead	1	OnRoad	Midland Painted Turtle	43.738273	-79.783469
volunteer	2025-08-24	Dead	1	OnRoad	Midland Painted Turtle	43.740812	-79.786928
volunteer	2025-09-07	Dead	1	OnRoad	Midland Painted Turtle	43.737741	-79.782799
volunteer	2025-09-21	Dead	1	OffRoad	Unknown	43.762465	-79.792699
volunteer	2025-10-19	Dead	1	OnRoad	Midland Painted Turtle	43.73817	-79.783151
volunteer	2025-11-05	Dead	1	OffRoad	Midland Painted Turtle	43.738361	-79.783392

# Appendix D



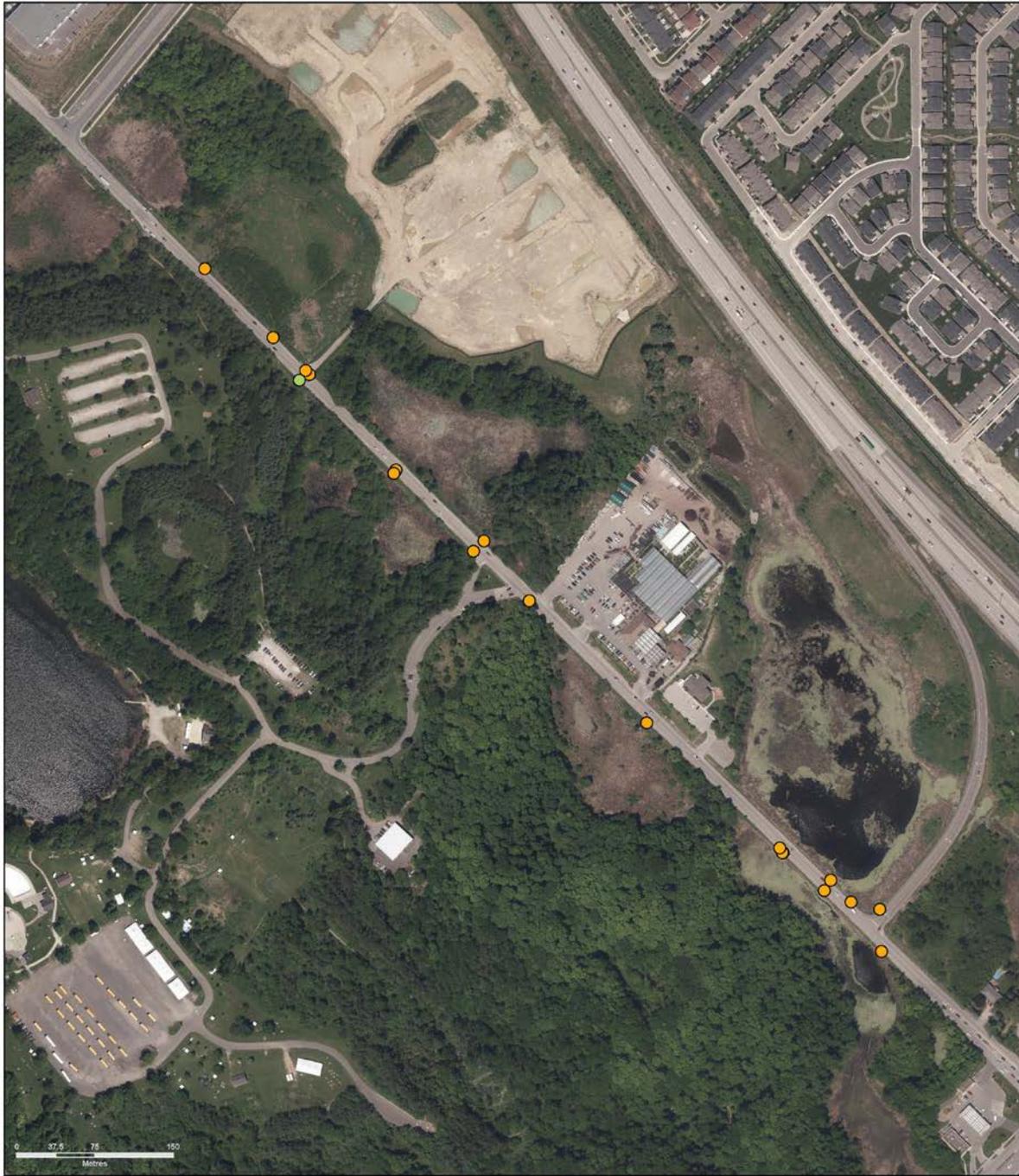
 <p> <b>Toronto and Region Conservation Authority</b>                  Date: 2025-12-04                  Created by: Restoration and Infrastructure                  Designator: First Base Solutions, City of Toronto, Peel Region, York Region, Durham Region, 2024             </p>	<p> <b>Heart Lake Road Ecology Monitoring</b>                  All Observations             </p>	<p><b>Legend</b></p> <ul style="list-style-type: none"> <li><span style="color: orange;">●</span> Turtles</li> <li><span style="color: blue;">●</span> Birds</li> <li><span style="color: green;">●</span> Frogs</li> <li><span style="color: yellow;">●</span> Mammals</li> <li><span style="color: pink;">●</span> Snakes</li> <li><span style="color: cyan;">●</span> Unknown</li> </ul>
<p><small>Disclaimer: The data used to create this map was compiled from a variety of sources &amp; dates. The TRCA takes no responsibility for errors or omissions in the data and retains the right to make changes &amp; corrections at anytime without notice. For further information about the data on this map, please contact the TRCA Restoration and Infrastructure Division (416) 661-6600. May not be reproduced without permission. This is not a plan of survey. Produced by Toronto and Region Conservation Authority under license with the Ministry of Natural Resources &amp; Forestry. © Queen's Printer for Ontario.</small></p>		



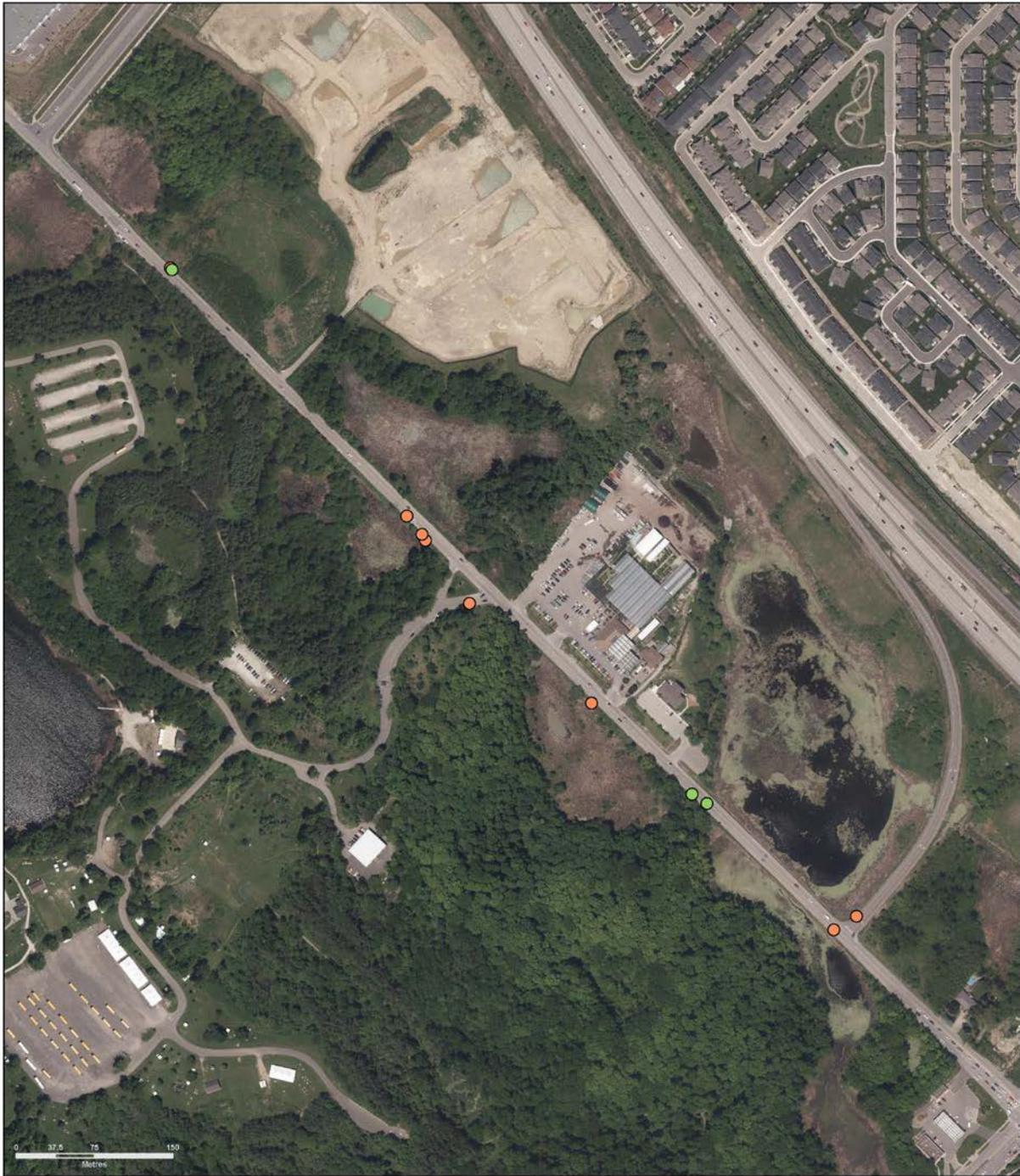
 <p>Date: 2025-12-04 Created by: Restoration and Infrastructure Orthophoto: First Base Solutions, City of Toronto, Peel Region, York Region, Durham Region, 2024</p>	<p><b>Heart Lake Road Ecology Monitoring</b></p> <p>Bird Observations</p>	<p><b>Species Recorded</b></p> <table border="0"> <tr> <td><span style="color: blue;">●</span> Northern Cardinal</td> <td><span style="color: yellow;">●</span> European Starling</td> </tr> <tr> <td><span style="color: green;">●</span> Black-Capped Chickadee</td> <td><span style="color: orange;">●</span> Downy Woodpecker</td> </tr> <tr> <td><span style="color: lightgreen;">●</span> Grey Catbird</td> <td><span style="color: red;">●</span> Unknown Bird</td> </tr> </table>	<span style="color: blue;">●</span> Northern Cardinal	<span style="color: yellow;">●</span> European Starling	<span style="color: green;">●</span> Black-Capped Chickadee	<span style="color: orange;">●</span> Downy Woodpecker	<span style="color: lightgreen;">●</span> Grey Catbird	<span style="color: red;">●</span> Unknown Bird
<span style="color: blue;">●</span> Northern Cardinal	<span style="color: yellow;">●</span> European Starling							
<span style="color: green;">●</span> Black-Capped Chickadee	<span style="color: orange;">●</span> Downy Woodpecker							
<span style="color: lightgreen;">●</span> Grey Catbird	<span style="color: red;">●</span> Unknown Bird							
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 <p>             Date: 2025-12-04              Created by: Restoration and Infrastructure              Orthophoto: First Base Solutions, City of Toronto,              Peel Region, York Region, Durham Region, 2024         </p>	<p> <b>Heart Lake Road Ecology Monitoring</b>              Frog and Toad Observations         </p>	<p><b>Legend</b></p> <ul style="list-style-type: none"> <li><span style="color: green;">●</span> Green Frog</li> <li><span style="color: orange;">●</span> Leopard Frog</li> <li><span style="color: green;">●</span> Unknown Frog/Toad</li> </ul>
<p><small>Disclaimer: The data used to create this map was compiled from a variety of sources &amp; dates. The TRCA takes no responsibility for errors or omissions in the data and retains the right to make changes &amp; corrections at anytime without notice. For further information about the data on this map, please contact the TRCA Restoration and Infrastructure Division, (416) 661-6600. May not be reproduced without permission. This is not a plan of survey. Produced by Toronto and Region Conservation Authority under licence with the Ministry of Natural Resources &amp; Forestry. © Queen's Printer for Ontario.</small></p>		



 <p>             Date: 2025-12-04              Created by: Restoration and Infrastructure              Orthophoto: First Base Solutions, City of Toronto,              Peel Region, York Region, Durham Region, 2024         </p>	<h3>Heart Lake Road Ecology Monitoring</h3> <p>Turtle Observations</p>	<p><b>Species Recorded</b></p> <ul style="list-style-type: none"> <li><span style="color: green;">●</span> Snapping Turtle</li> <li><span style="color: orange;">●</span> Midland Painted Turtle</li> </ul>
<p><small>Disclaimer: The data used to create this map was compiled from a variety of sources &amp; dates. The TRCA takes no responsibility for errors or omissions in the data and retains the right to make changes &amp; corrections at anytime without notice. For further information about the data on this map, please contact the TRCA Restoration and Infrastructure Division, (416) 663-6500. May not be reproduced without permission. This is not a plan of survey. Produced by Toronto and Region Conservation Authority under license with the Ministry of Natural Resources &amp; Forestry, © Queen's Printer for Ontario</small></p>		



 <p>             Date: 2025-12-04              Created by: Restoration and Infrastructure              Orthophoto: First Base Solutions, City of Toronto, Peel Region, York Region, Durham Region, 2024         </p>	<p> <b>Heart Lake Road Ecology Monitoring</b>              Snake Observations         </p>	<p><b>Species Observed</b></p> <ul style="list-style-type: none"> <li><span style="color: orange;">●</span> Eastern Garter Snake</li> <li><span style="color: green;">●</span> Unknown Snake</li> </ul>
<p><small>Disclaimer: The data used to create this map was compiled from a variety of sources &amp; dates. The TRCA takes no responsibility for errors or omissions in the data and retains the right to make changes &amp; corrections at anytime without notice. For further information about the data on this map, please contact the TRCA Restoration and Infrastructure Division. (416) 661-6600. May not be reproduced without permission. This is not a plan of survey. Produced by Toronto and Region Conservation Authority under licence with the Ministry of Natural Resources &amp; Forestry. © Queen's Printer for Ontario</small></p>		