

TORONTO AND REGION CONSERVATION

2016 Road Ecology Citizen Science Project



Table of Contents

1.0	Introduction.....	2
2.0	Methods	4
i.	Sites	4
ii.	Criteria for suitability of each site for citizen science volunteer monitoring.	5
iii.	Selected Sites.....	5
iv.	Citizen Scientist Selection	8
v.	Survey Methods.....	8
vi.	Training Topics.....	8
vii.	Field Training.....	8
3.0	Results	9
i.	Volunteer accomplishments.....	9
ii.	Survey effort	9
	9
iii.	Wildlife Vehicle Collisions (WVCs)	10
4.0	Discussion	14
i.	Participant Survey.....	14
ii.	Participant Comments (author's responses in italics)	14
iii.	Engagement in the Community.....	14
	Appendix A.....	16
	Appendix B.....	17
	Appendix C.....	21

List of Figures

Figure 1 - Species at Risk richness in Southern Ontario.....	2
Figure 2 - Ministry of Transportation road network, Southern Ontario (Credit: University of Waterloo)	3
Figure 3 - Heart Lake Rd, HLCA to Countryside Drive, Brampton	6
Figure 4 - Castlederg Side Road, Caledon.	6
Figure 5 - McVean Drive, Brampton.	7
Figure 6 - Old Colony Road, Richmon Hill.	7
Figure 7 – WVCs, Heart Lake Road, Brampton.	11
Figure 8 – WVCs, Castlederg Road, Caledon.....	11
Figure 9 – WVCs, McVean Drive, Brampton.	12
Figure 10 - WVCs, Old Colony Road, Richmond Hill.....	12
Figure 11 - List of species WVCs per site.	13

1.0 Introduction

Toronto and Region Conservation Authority (TRCA) is committed to researching and resolving road ecology issues. Throughout TRCA's jurisdiction, development within municipalities is increasing reducing habitat resulting in the ability of wildlife populations to survive.

A primary threat to wildlife is roads which create; habitat loss, fragmentation and degradation as well as wildlife/vehicle collisions (WVCs) which occur as a result of traffic volume. Various forms of pollution associated with roads including light, noise, chemical, heat, vibrations, spread of invasive species and reduced gene flow are other negative consequences of roads that threaten biodiversity and Species at Risk (SAR).

Southern Ontario has the greatest SAR richness in the province of Ontario (OMNRF 2015, Figure 1) and the greatest density of people and roads (Figure 2). No point in southern Ontario is more than 1.5 km from a road excluding large lakes and protected areas (Gunson et al. 2012), and the potential for interaction between wildlife and vehicles is overwhelming.

<https://www.ontario.ca/environment-and-energy/species-risk-area> (October 7, 2015)

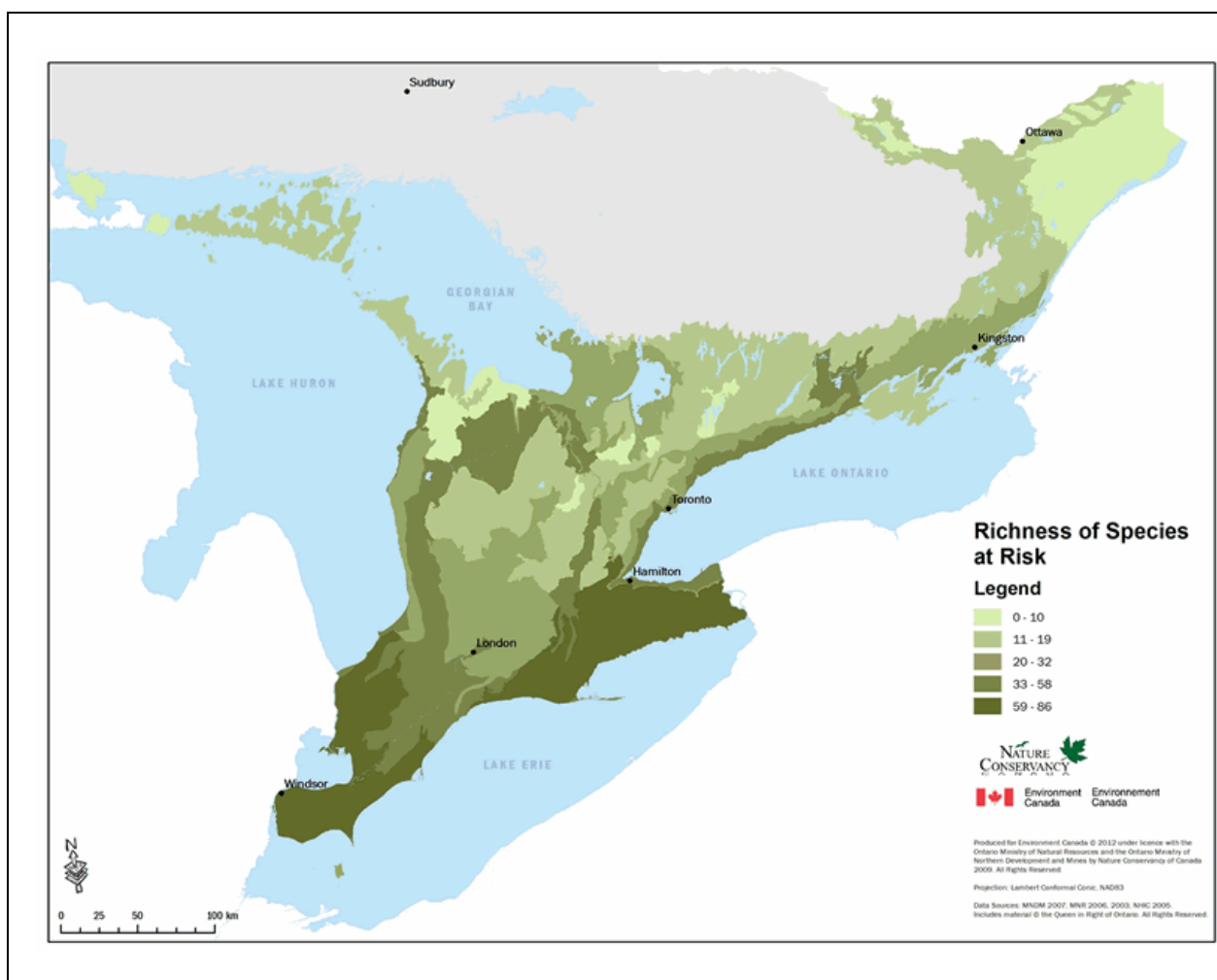


Figure 1 - Species at Risk richness in Southern Ontario

(Credit: Government of Canada)



Figure 2 - Ministry of Transportation road network, Southern Ontario (Credit: University of Waterloo)

TRCA works with municipalities and partners to address local road ecology issues by:

- identifying sites of concern,
- recognizing opportunities to improve habitat connectivity,
- reviewing and commenting on planning and development applications,
- influencing, updating and creating planning policies to help mitigate wildlife road mortality,
- collecting data,
- recommending, implementing and monitoring mitigation, and
- engaging the public to raise awareness and support for road ecology initiatives.

In these ways, TRCA works towards building sustainable communities rich in biodiversity and upholds the provisions of the Endangered Species Act (2007) that protects SAR.

The Road Ecology Citizen Science Project (RECSP) is a partnership project among TRCA, the Ontario Road Ecology Group (OREG), York University, Regional Municipality of Peel, Regional Municipality of York, City of Brampton, Town of Caledon, and Town of Richmond Hill. RECSP builds on the success of TRCA's Heart Lake Road Ecology Monitoring Project (HLREMP 2011) that operated with a team of staff-supervised volunteers trained as citizen scientists to collect wildlife/road interaction data. This study was initiated in an effort to better evaluate and reduce wildlife road mortality at the designated Provincially Significant Wetlands (PSW) along Heart Lake Road between Sandalwood Parkway and Mayfield Road in Brampton, Ontario.

Citizen science is an integral component of road ecology research. Ontario's extensive road network along with the finite funding resources available to support road ecology research and data collection necessitates public involvement to facilitate data collection. Technological advancements in data recording and submission methods (e.g. mobile applications) have been developed to help the public contribute wildlife/road interaction sightings. Examples of applications include: RoadWatchBC, the California Roadkill Observation System, I-70 Wildlife Watch in Colorado as well as Roadkill Garneau. Technology has the potential to improve citizen science projects by ensuring credible data collection by guiding citizen scientists through the scientific process. Throughout a typical field study season and under proper management and direction, citizen scientists contribute valuable research hours enabling data collection across many locations. These dedicated members of the public impart local knowledge and serve as ambassadors that share with others why conservation is important.

Collectively and effectively they can assist efforts in moving governments to take action to protect and recover local biodiversity. Participation of citizen scientists drives project success from the research to the implementation phases and fosters increased public engagement and support.

The federal government of Canada invests in stewardship projects including those with citizen science protocols which contribute to the recovery of SAR by engaging Canadians in conservation actions that benefit wildlife. The government of Canada further acknowledges that stewardship is an important component in habitat protection, recovery of species, preservation of biodiversity and that community engagement and partnerships are integral to making stewardship a successful conservation tool. Recovery of SAR depends upon an informed and engaged public and trained citizen scientists to augment and accelerate conservation efforts (Government of Canada 2017).

The Environmental Commissioner of Ontario also recognizes the important role citizen science plays in ecological monitoring and acknowledges the vast amount of information, particularly in relation to amphibian populations, that citizen scientists have contributed (Environmental Commissioner of Ontario, 2016).

TRCA has been aware of the value of citizen science since 2002, when the Terrestrial Volunteer Monitoring Program began training volunteers to monitor the forest, wetland, and meadow habitat in the Greater Toronto Area (GTA). By engaging volunteers, TRCA has provided an opportunity for citizens to contribute to environmental protection in a meaningful way and learn more about local native species and their habitat needs. Other notable citizen science programs include; Toronto Zoo Ontario Turtle Tally, Toronto Zoo Frog Watch Ontario, Ontario Breeding Bird Atlas and Ontario Reptile and Amphibian Atlas.

Citizen science has made substantial contributions to science, education and society and it is recognized that some conservation projects would not be possible without citizen scientists (Kobori et al. 2016). With proper recruiting methods, strong protocol and safety training as well as regular data quality evaluation, citizen science will advance road ecology through research and public engagement.

The purpose of this study was to expand TRCA's citizen science road ecology volunteer monitoring program at the PSW's along Heart Lake Road and assist with opportunistic data collection and contribute to the validation of TRCA's Habitat Connectivity Models. Findings from this study will also be used to develop future citizen science initiatives to provide planning and mitigation decisions to municipalities and help protect wildlife from the threats of roads.

2.0 Methods

i. Sites

Road ecology monitoring sites were selected using TRCA's Habitat Connectivity Model, using geographical information system (GIS) technology. The Habitat Connectivity Model identified more than 3,000 locations in the GTA where roads crossed open streams or culverts which are potential wildlife crossings. All possible sites (i.e. every stream regional road intersection) were identified in the Humber and Rouge watersheds. Sites were screened via mapping to ensure they were: located throughout the watersheds, located on two lane regional roads, were not located within subdivisions and were on permanent a waterbody (e.g. streams). This first step identified approximately 100 priority sites. For all possible sites the percentage of each land-cover type within 1,000 metre buffers were calculated.

TRCA selected RECSP sites based on criteria to support science of the Habitat Connectivity Model and provide a safe experience for citizen scientists. Of these sites, staff paired locations with similar landscape features and varied traffic patterns to design a randomized paired sample study. Staff retained twenty-two sites to be monitored during 2016. Of these twenty-two sites, four were suitable for volunteers.

In 2015 WVCs at twenty-two sites split by eleven in the Rouge Watershed and eleven in the Humber Watershed. These were monitored by staff and in 2016 WVCs at twenty-two sites in the Humber Watershed were monitored by the Research and Climate Programs group at the TRCA.

Monitoring included the following:

- Sites are located on regional roads with a speed limit less than 70 km/hr.
- Sites are centered on a stream(s) road intersection and the road is monitored for 300 metres in either direction.
- Sites are selected to ensure they covered a gradient of rural to urban land-covers, varied in their priority for regional connectivity (TRCA 2015), had different crossing structures present and varied in their priority for crossing structures as outlined by the Valley and Stream Crossings Guideline.
- A correspondence analysis was conducted on the percent habitat and priority sites were screened to ensure that distribution of sites included all habitat types and were located on a gradient of connectivity reducing the priority sites to approximately fifty sites.
- The final fifty priority sites were visited in person, the type of structure recorded and any safety hazards identified.
- The final set of monitoring sites consisted on sites that were safe to monitor and had a range of crossing structures present.
- From the priority sites, four citizen science sites were identified in close proximity to conservation areas for monitoring and outreach.

ii. Criteria for suitability of each site for citizen science volunteer monitoring.

- Maximum posted speed limit 70 km/hr,
- Single lane road,
- Clear lines of sight (no vegetation or changes in elevation),
- Straight lines of sight (clear view of the start and end of the survey area),
- Minimum road shoulder width of 1.5 meter,
- Available parking near site,
- A safe area to store equipment.

iii. Selected Sites

- a. Heart Lake Road, Brampton, Region of Peel (Figure 3): Road mortality is an important issue at Heart Lake Road. The PSWs bisected by Heart Lake Road represent a 99 hectare wetland complex that scores in the top ten most important evaluated wetlands in Ontario out of nearly 1,500 evaluated wetlands (Appendix A, Evaluated Wetlands Spreadsheet). This area hosts a variety of amphibians, reptiles, mammals and birds, some of which are SAR. Extensive research conducted by TRCA from 2011 to date, has documented numerous WVCs and identified three wildlife mortality hotspots along this site.

The RECSP study encompassed a 635 meter area between the entrance to Heart Lake Conservation Area (HLCA) travelling north to Countryside Drive (43.741001, -79.787476)

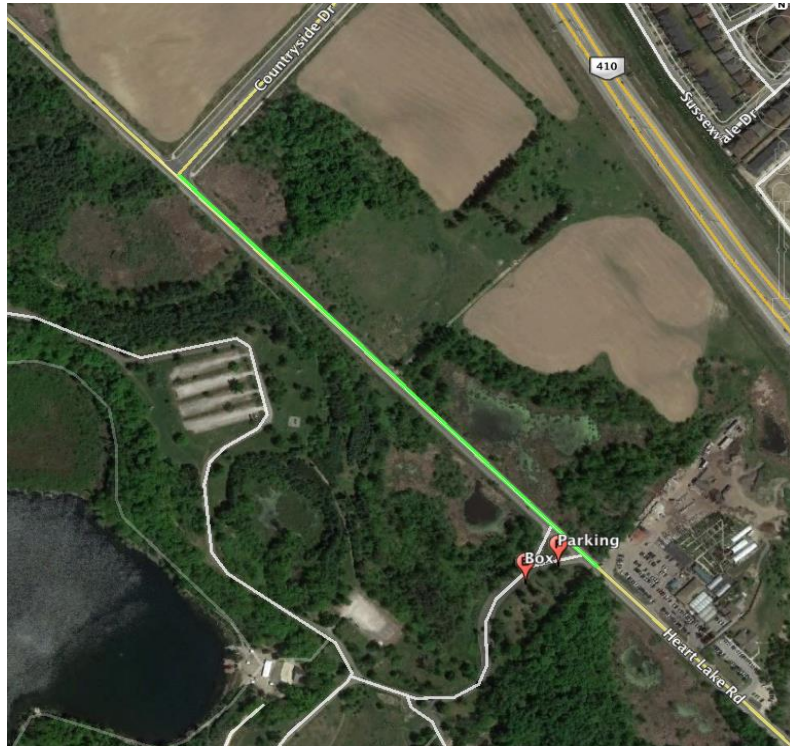


Figure 3 - Heart Lake Rd, HLCA to Countryside Drive, Brampton

- b. Castlederg Side Road, Caledon, Region of Peel (Figure 4): A 510 meter portion of Castlederg Side Road bisects a typical mixed use landscape that includes: a small creek crossing and adjacent roadside wetland, a wet forest, an industrial site and farmland. (43.867685°, -79.819822°).

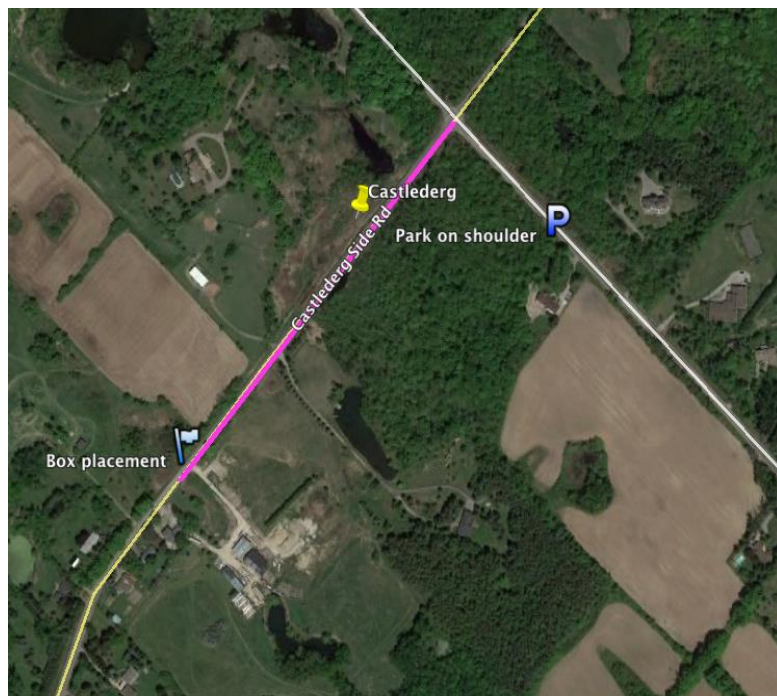


Figure 4 - Castlederg Side Road, Caledon.

- c. McVean Drive, Brampton, Region of Peel (Figure 5): An 875 meter portion of McVean Drive includes a stream crossing, adjacent wetlands and farmland. (43.785222°, -79.703911°).

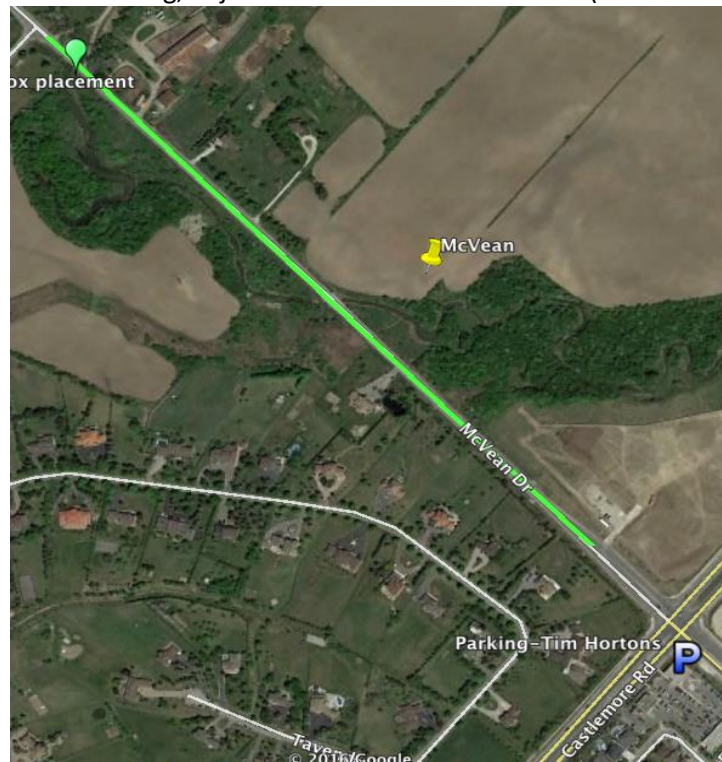


Figure 5 - McVean Drive, Brampton.

- d. Old Colony Road, Richmond Hill, York Region (Figure 6): The 500 meter section of Old Colony road starts at the boundary of a school and ends at the boundary of a housing development. This road crosses over an ephemeral stream with parkland and farmland to the south and forest and wetland to the north. (43.938565°, -79.435446°).

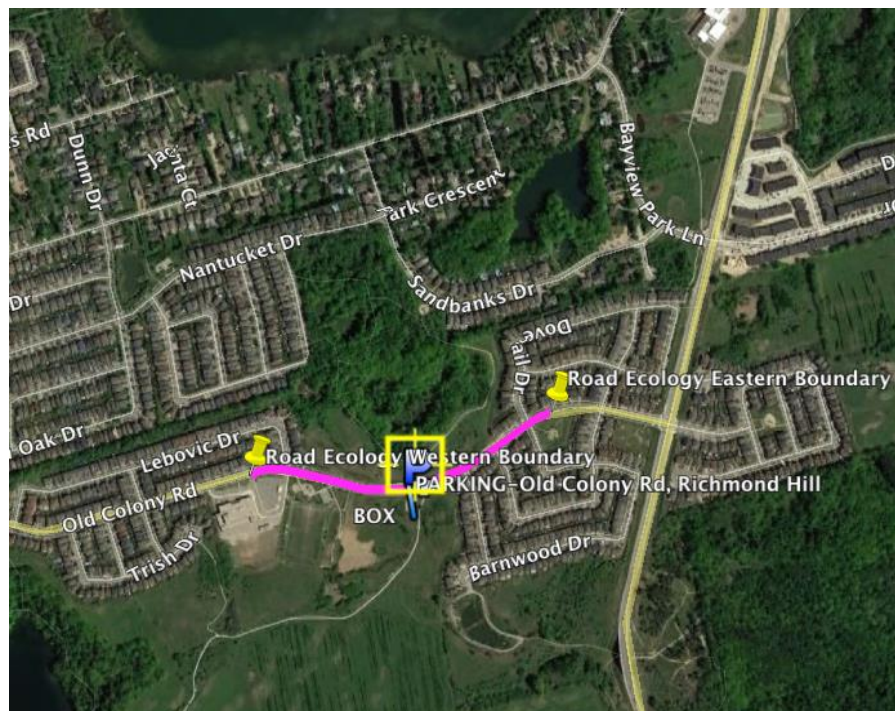


Figure 6 - Old Colony Road, Richmond Hill.

iv. Citizen Scientist Selection

Citizen Scientists for RESCP were recruited in March 2016 through an advertising campaign using local and municipal newspapers and by posting on TRCA's website. TRCA staff reviewed applications and selected participants for safety and data collection protocol training commencing in early April. TRCA staff in collaboration with OREG and York University invited applicants to an orientation session to become familiar with the project and requirements of volunteering. Staff also organized multiple on-site training sessions in April and in May.

v. Survey Methods

TRCA developed the citizen science based road ecology monitoring protocol that was implemented at the four selected sites. Staff trained citizen scientists to identify and record wildlife road interactions and upload data to a mobile tablet and subsequently into a central database. Monitoring took place between 9:00 a.m. and 12:00 p.m. on various days at site locations.

vi. Training Topics

- **Road Safety:** TRCA staff reviewed internal policies and established road safety protocols, including Ministry of Transportation of Ontario (MTO) safety recommendations within the Ontario Traffic Manual Book 7 (Appendix C). Using these resources, staff developed safety protocol for RESCP.
- **Species Identification:** Reptile and amphibian identification cards were provided by The Toronto Zoo and a detailed manual for species identification purposes was produced internally (Appendix B). Digital ID guides were also developed and included in the tablet software used for data recording.
- **Data Collection:** Volunteers were taught to identify fauna and catalogue (using an electronic tablet) that were sighted while monitoring. Volunteers categorized animals encountered by class, order or species with accompanying photographic references. They also recorded location using a built-in GPS function in the tablet.

vii. Field Training

- **On-Site:** TRCA staff conducted two, three hour training sessions for citizen scientists on weekends in April and May, reviewing road safety, species identification and data collection. Citizen Scientists worked in groups of three: one person responsible for scanning road traffic (i.e. safety person) and two people responsible for scanning the shoulder and the road for evidence of wildlife/road interactions. Citizen scientists rotated roles every 500 metres of survey area.
- **Staff-Supervised Monitoring:** Further to on-site sessions, a TRCA staff accompanied each citizen scientist for the first three monitoring surveys. Staff oversaw species identification, data collection protocols and reinforced safety procedures.
- **Spot Checks:** Further to the three supervised surveys, TRCA staff performed routine and unannounced spot checks at each site to ensure compliance with protocols.

3.0 Results

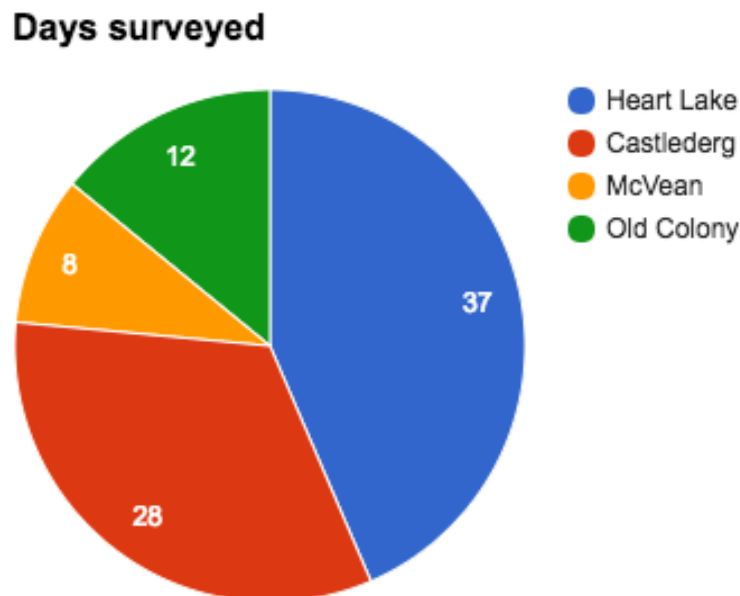
i. Volunteer accomplishments

A total of 661 hours were logged by twenty-two participants on Track-it-Forward, a volunteer management website. This effort represents what was logged by core volunteers. Initially there were thirty-two volunteers signed up for the program who participated in training protocols including ten who completed ten or less hours before withdrawing from the program.

ii. Survey effort

Although the project was initially designed with an even representation for all sites, logistics of ensuring a group of volunteers became familiar with one site while operating in teams of three greatly reduced deliverables on study design. Consequently, certain sites received more survey effort than others. Due to sizes of available participant teams, three of the four sites had an initial two-day per week schedule, while Castlederg was scheduled only on Friday. The McVean site had a difficult time amassing the minimum number of volunteers and many survey days were cancelled due to lack of participation. Wednesday was eliminated from McVean's schedule and data collection focused on Sundays. TRCA staff also monitored the McVean site as part of regular road survey studies.

The number of days surveyed at each site is as follows:

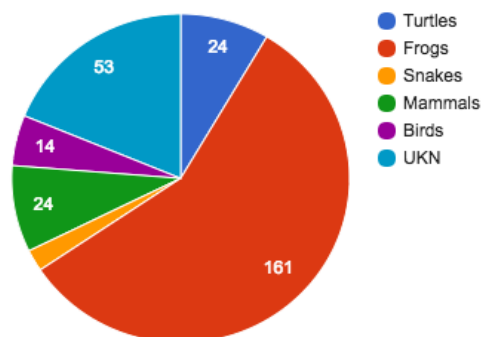


iii. Wildlife Vehicle Collisions (WVCs)

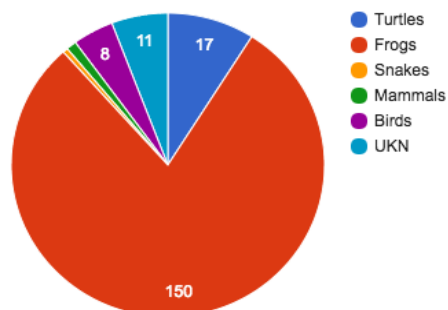
Wildlife fatalities recorded at each location with maps below:

Location	Total WVCs	Turtles	Frogs	Snakes	Mammals	Birds	UKN
Heart Lake	285	24	161	6	24	14	53
Old Colony	19	0	10	0	2	1	6
McVean	106	2	76	0	10	13	6
Castlederg	189	17	150	1	2	8	11
Total	601	43	397	7	38	36	76

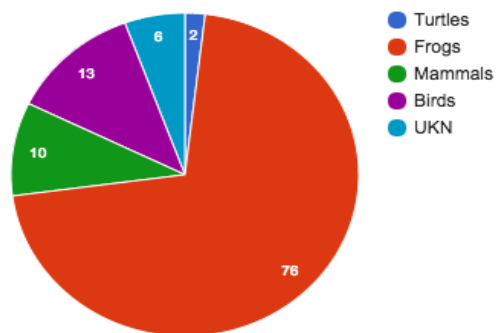
Heart Lake



Castlederg



McVean



Old Colony

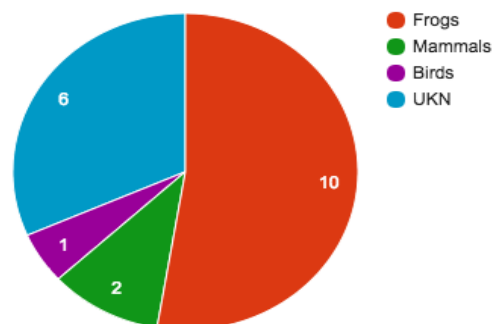




Figure 7 – WVCs, Heart Lake Road, Brampton.

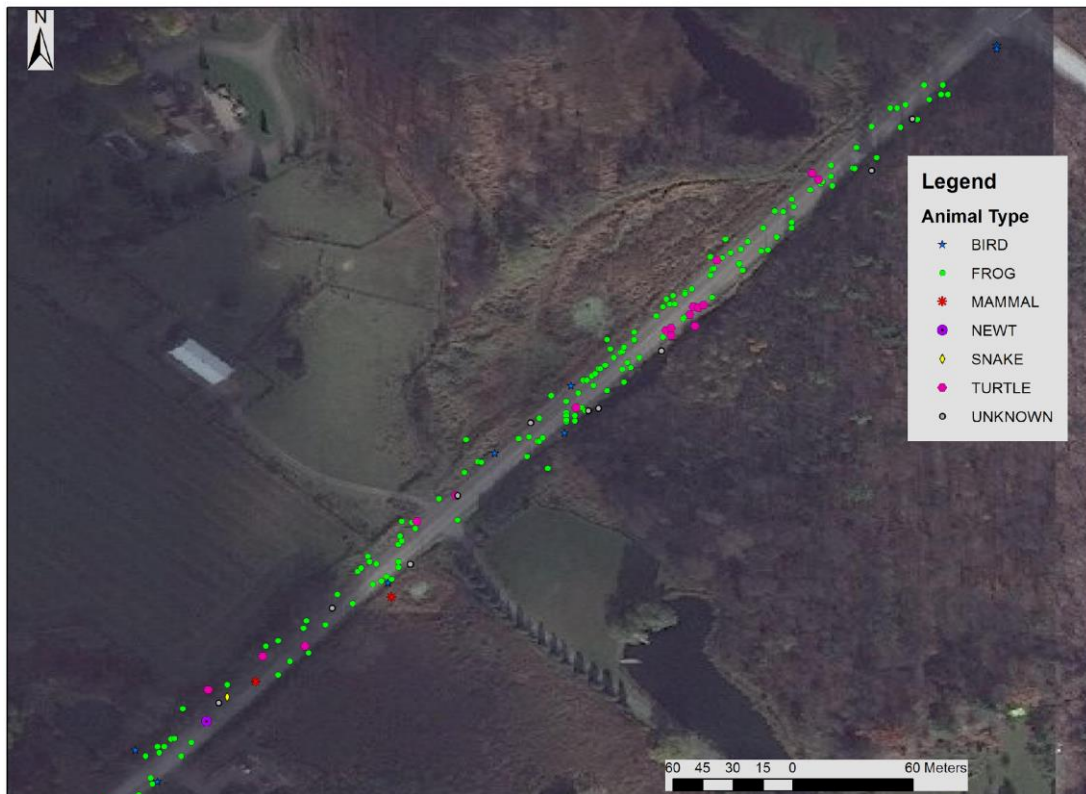


Figure 8 – WVCs, Castlederg Road, Caledon



Figure 9 – WVCs, McVean Drive, Brampton.



Figure 10 - WVCs, Old Colony Road, Richmond Hill

Site	Species	Heart Lake	Castlederg	McVean	Old Colony
Turtles	Midland painted	14	1		
	Snapping		5	1	
	No ID	13	11	1	
Frogs	Green	17	7	5	
	Leopard	27	12	3	
	American toad				2
	Spring peeper		2		
	Wood		1	1	
	Gray tree	11	1		3
	Unknown Frog	106	127	66	5
Newt	Unknown Newt		1		
Snakes	Eastern garter	4	1		
	Dekay's brown				
	Unknown Snake	2			
Mammals	Eastern chipmunk	1	1		
	Gray squirrel	3			
	Deer mouse			1	
	Meadow vole	1		3	1
	Meadow jumping mouse	1			
	Star-nosed mole				1
	Muskrat	1			
	Raccoon	3			
	Striped skunk	3		1	
	White-tailed deer	1			
	Unknown Mammal	8	1	5	
Birds	American goldfinch	6	2	1	
	American robin	2	2		
	Baltimore oriole	1			
	Red-winged blackbird			1	
	Swamp sparrow			1	
	Unknown Bird	4	4	10	1
Undetermined	Unknown species	54	10	6	

Figure 11 - List of species WVCs per site.

4.0 Discussion

i. Participant Survey

Following the completion of the RESCP, staff followed up with a survey to gauge participant satisfaction receiving sixteen responses. The following is a summary of the survey:

Overall satisfaction	50% very satisfied	50% somewhat satisfied	
Species ID training	53.3% felt comfortable with ID	33.3% felt somewhat comfortable with ID	13.3% could have used more training
Safety Protocols	100% felt safe		
Participate Again?	75% yes	0% no	25% possibly
Opinion of TRCA staff	87.5% Excellent	12.5% Good	

ii. Participant Comments (author's responses in italics)

- Three people surveying felt like too many (*safety procedures dictated a minimum of three people*)
- Easier to organize with two people (*yes it would have been*)
- Should allow volunteers to select their own time to monitor (*in retrospect, fewer monitoring days would have been lost, however this arrangement would have been very difficult to supervise*)
- I got left off emails for recognition events (*note: there were none*)
- Showed up only to find that the monitoring had been cancelled (*participants were emailed notifications, but in hindsight, maybe a text would have been better*)

(For complete results please see: <https://www.surveymonkey.com/results/SM-HW9F8KRF/>)

iii. Engagement in the Community

Using volunteer field assistants to conduct field work and data collection is increasing and citizen science is being recognized as a valuable tool to credibly amass data while providing people with experience in scientific processes and perhaps most importantly, creating a population that is informed and concerned about conservation issues (Kintsch et al. 2015). Citizen Science projects that target reptiles and amphibians in relation to road ecology are generally lacking (Kintsch et al. 2015). RESCP provides an excellent example of an initiative that may be applied elsewhere and specifically contributes much needed reptile and amphibian road interaction data.

The value of this project extends beyond the scope of this study. In 2016 alone, thirteen Federal SAR recovery strategies, seven Federal Multi-species Action Plans and one Provincial SAR recovery strategy identified road mortality as a threat and identified using stewardship tools and citizen science as a high priority when developing and implementing research and management approaches. The power of public engagement and involvement is understood by those involved in SAR recovery efforts. Development and findings from RESCP contribute to Federal and Provincial Conservation goals and initiatives.

References

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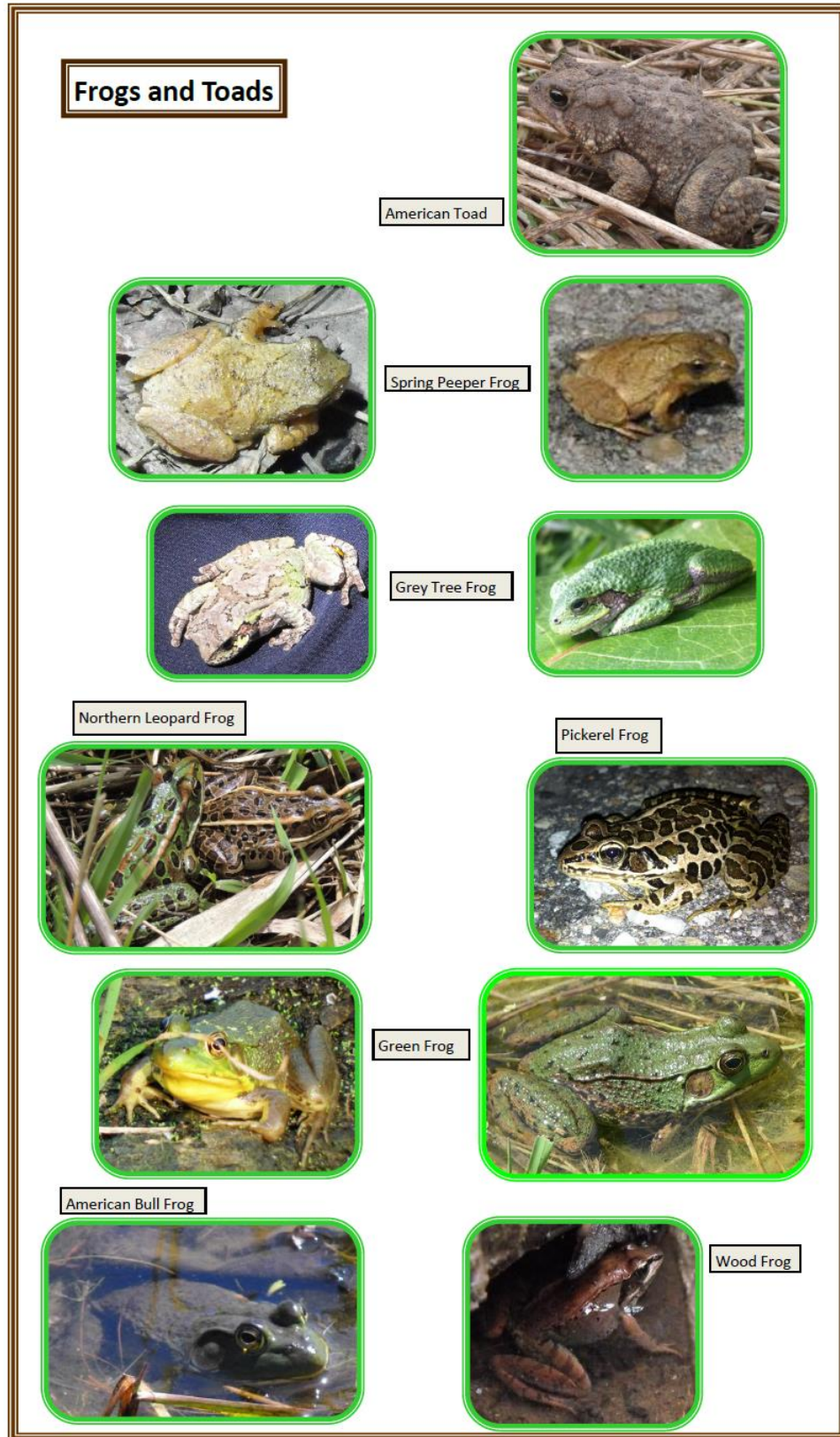
Appendix A

Evaluated Wetlands Spreadsheet

EVALUATED WETLAND NAME	EVALUATED WETLAND SIZE	EVALUATED WETLAND TYPE	BIOLOGICAL COMPONENT SCORE	SOCIAL COMPONENT SCORE	HYDROLOGICAL COMPONENT SCORE	SPECIAL FEATURES SCORE	OVERALL WETLAND SCORE
Luther Marsh	4031.6	Evaluated Wetland Complex	193	212	219	250	874
Nappan Island Complex		Evaluated Wetland Complex	233	192	191	250	866
Cranberry Oil Well Bog Wetland Complex	372.57	Evaluated Wetland Complex	187	195	222	250	854
Little Cataraqui Creek Complex	320.7	Evaluated Wetland Complex	161	224	219	250	854
South Dorchester Swamp (UT 23)		Evaluated Wetland Complex	185	181	236	250	852
Snelgrove Brook		Evaluated Wetland Complex	196	177	229	250	852
Heart Lake Wetland Complex	99	Evaluated Wetland Complex	174	183	243	250	850

Appendix B

Species Identification



Salamander's

Salamander's of the area have very unique identification features as noted below.



Eastern Red-backed Salamander (*Plethodon cinereus*) Leadback phase shows overall grey-ish colour. Typical features of eastern-red back salamander do not apply when in leadback phase.

Eastern Red-backed Salamander (*Plethodon cinereus*) Stripe along back of body, red, yellow or orange colour.



Spotted Salamander (*Ambystoma maculatum*) Dark body with 2 rows of yellow spots



Snakes



Eastern Garter Snake



DeKay's Brown Snake



Milk Snake



Smooth Green Snake



Red-Bellied Snake



Turtle's of Ontario

There are nine species of turtle's native to Ontario. Of these nine, seven are on the "Species at Risk in Ontario List". Female turtles will often lay their eggs in the soft gravel along roadsides. This puts them at risk of wildlife, vehicle collisions and the eggs at risk of being predated. Each of the turtle species have unique features allowing them to be fairly easily identified.



Snapping Turtle



Musk (Stinkpot) Turtle



Blanding's Turtle



Midland Painted Turtle



Red-eared Slider



Appendix C

Road Safety Protocol

This document includes the following:

1. Volunteer Safety Protocol
2. Volunteer Injury Reporting Process
3. Volunteer Road Ecology Monitoring – Safe Work Procedure
4. Volunteer Road Ecology Monitoring Safe Work Procedures Competency Sign Off
5. Competency Checklist (to be completed by Supervisor at Field Training Session)

1. Volunteer Safety Protocol

All volunteers must:

1. In case of emergency call 911.
2. In the case of an injury, follow the Volunteer Injury reporting process.
3. Attend one Field Training Session.
4. Sign “Volunteer Waiver” and submit to Project Coordinator.
5. Complete all mandatory AODA and TRCA orientation training online, review summary of TRCA’s Harassment, Health and Safety, E-Communication Policies and Code of Conduct. Sign “Volunteer Intake Form” and submit to Project Coordinator.
6. Sign “Volunteer Letter of Offer” and submit to Project Coordinator.
7. Check in with Project Coordinator at the start and end of each shift using an agreed upon method (email, text message)

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8. Not conduct surveys in rain, thunder or high winds, where weather conditions inhibit safety while on or near the roads.
9. Do a safe road assessment and follow the procedure to properly place two “Road Works” signs on the side of the roadway prior to the commencement of work. One at either extent of the study site and on the side of the road of oncoming traffic. When the work is done the signs must be dismantled and stored.
10. Work in groups of 3 and comply with the roles assigned as outlined in the “Safe Work Procedure”.
11. Adhere to the “Safe Work Procedure” for Volunteer Road Ecology Monitoring.
12. Walk the shoulder of the road, facing on-coming traffic.

13. Wear Personal Protective Equipment that consists CSA approved safety boots, Class 2 high visibility safety vest, Type 1 hard hat, CSA approved eye protection. If carrying a backpack, the safety vest is to be worn over the backpack.
14. Park vehicles at designated locations as indicated on site fact sheets.
15. Carry a copy of the Road Occupancy Permit for your site at all times while on site.
16. Only remove wildlife (dead or alive) when there is a sufficient gap in traffic to do so as you are not authorized to stop or direct traffic.
17. Carry a charged cell phone (minimum 1 per group).
18. Not eat during surveys. Use the hand sanitizer at the end of the survey and before eating.
19. Avoid all visual and auditory distractions throughout shift such as wearing ear buds, texting, phone calls, etc. Adhere to duties as assigned.
20. Wear Nitrile Gloves. TRCA will supply.
21. Be prepared for the conditions with:
 - a. Sunscreen
 - b. Bug spray
 - c. Extra clothing layers
 - d. Extra drinking water

2. Volunteer Injury Reporting Process for the Volunteer:

1. Call 911 if necessary
2. Contact Project Coordinator

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Record information as outlined in the Visitor / Volunteer Injury Form in folder. Injury forms will be in the box on site.

3. Take photos of injury and scene.

3. Volunteer Road Ecology Monitoring – Safe Work Procedure

Background Information

This project involves collecting road/ wildlife interaction data from the roadside. This work necessitates compliance with Ontario Traffic Manuals - Book 7 and municipal requirements for road side works.

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. CSA approved safety boot.
2. CSA approved eye protection
3. Type 1 hard hat
4. High visibility class 2 safety vest
5. Nitrile gloves
6. Hand sanitizer
7. First aid kit including tick removal kit
8. Working cell phone (1 amongst group of 3)
9. 2 'men at work' road signs
10. 5 28" pylons

Procedure

Volunteers must be given detailed instruction from a properly trained and competent person on all procedures and safe practices. No monitoring will take place without the presence of at least 3 volunteers. Roles and responsibilities shall be designated at the beginning of each shift. At any time volunteers are to communicate any potential hazards or concerns to the volunteer coordinator.

1. Pre-monitoring set-up

- a. Park vehicles at designated parking area identified on site fact sheets.
- 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.

- c. Contact volunteer coordinator to indicate that monitoring is about to commence (via text or email).
- d. Review all personal protective equipment and ensure that you have all items on the **Personal Protective Equipment Requirements list**. **Inspect all equipment to ensure that it is in good working order**
- e. Review “Conditions that Affect Traffic Control Requirements” in the site fact sheet for the site being monitored and note any changes to conditions. If conditions have changed record on a new sheet and submit to Project Coordinator. Take special note of Emergency road repair, broken down vehicles, obstructions to traffic flow.
- f. Observe site and identify emergency escape route.
- g. 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">- Observes oncoming traffic in both directions at all times.- Observes oncoming traffic (work side) during removal.- Gives the ‘All Clear to A for removal- Communicates potential hazards to team.- Shifts safety set-up as required.- Activates 911 if necessary.
B (Data Collection)	<ul style="list-style-type: none">- Collects data- Observes for wildlife on roadway- Communicates potential hazards to team
C (Support)	<ul style="list-style-type: none">- Observes for wildlife on shoulder- Observes oncoming traffic (opposite work side) during removal- Gives the ‘All Clear’ to A for removal- Assists with data collection at roadside- Communicates potential hazards to team

2. At work procedure

- a. Set up ‘men at work’ roadside signs at designated locations identified in site fact sheets (set up will need to be moved once for each monitoring session)

- b. Walk on shoulder facing on-coming traffic, following the route identified in the site fact sheets.
- c. When stopped to record data ensure that you are within a pylon set up as depicted in figure 1 below
- d. Volunteer B (Data Collector) to only remove wildlife (dead or alive) when there is a sufficient gap in traffic to do so and when given the 'all clear' by volunteer A (Spotter and safety set up) and volunteer C (support). Volunteers are not authorized to stop or direct traffic.

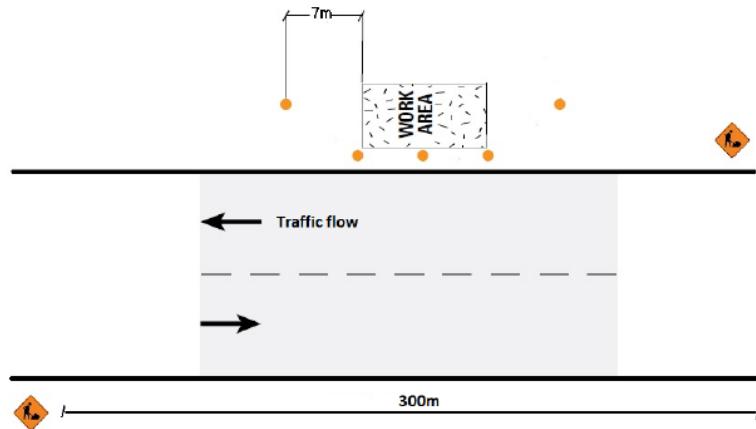


Figure 1: Work Area Set Up

3. Close out procedure

- a. When the work is done the signs must be put back inside the storage box stored onsite. Contact volunteer coordinator to inform that the shift is complete (via text or email).
- b. Upload data at secure wifi location.
- c. Record volunteer hours worked at <http://www.trackitforward.com/site/trca>

Important Contact Information:
 Volunteer Coordinator
 Marc Dupuis-Desormeaux
 trcaroadecology@gmail.com
 Cell: 647-221-1929

4. Volunteer Road Ecology Monitoring Safe Work Procedures - Competency Sign Off

I have reviewed the "Volunteer Road Ecology Monitoring Safe Work Procedures" document and have demonstrated the following tasks to a competent supervisor.

- ☐ Pre-monitoring Procedure (Assigning roles and responsibilities, setting up signs, etc.)
- ☐ At Work Procedure (assessing traffic flows, traffic judgement, etc.)
- ☐ Close-out Procedure (Shift completion)

Name	Signature	Date

Competent Supervisor Name:

Competent Supervisor

Signature:

5. Competency Checklist

(to be completed by Supervisor at Field Training Session)

Competency Checklist

Volunteer Name: _____

- ☐ Has gone through Safe Work procedures with supervisor and demonstrates a sound understanding of the outlined principles
- ☐ Demonstrates knowledge of required PPE
- ☐ Able to identify hazards during pre-monitoring and at work procedure
- ☐ Demonstrates knowledge of doing Pre-monitoring Procedure (Assigning roles and responsibilities, setting up signs, etc.)
- ☐ Demonstrates knowledge of doing At Work Procedure (assessing traffic flows, traffic judgement, etc.)
- ☐ Demonstrates knowledge of doing Close-out Procedure (Shift completion)

Supervisors Name: _____

Supervisors Signature: _____