



# Conserving Carolinian Reptiles

An Evaluation of Conservation Project Outcomes (2009-2014)



A Program Evaluation Report

*prepared for*



LongPointLandTrust.ca

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### Long Point Basin Land Trust:

P.O. Box 468, Port Rowan, Ontario, Canada N0E 1M0

Email: [nature@longpointlandtrust.ca](mailto:nature@longpointlandtrust.ca)

Web: [LongPointLandTrust.ca](http://LongPointLandTrust.ca)

Facebook: [facebook.com/lpblt](https://www.facebook.com/lpblt)

Twitter: @lpblt



Hatchling Blanding's Turtle (cover, upper), Eastern Foxsnake (cover, lower), Smooth Greensnake (above). Photos: Gregor Beck

## EXECUTIVE SUMMARY

This report documents an evaluation of the Conserving Carolinian Reptiles project, a multi-year initiative of the Long Point Basin Land Trust (LPBLT) in the Carolinian Region of Ontario. The goals of the project are: 1) the recovery and conservation of reptile species at risk and their habitats within the Long Point Basin; and, 2) the development of an informed, concerned citizenry which participates actively in recovery and conservation efforts. The purpose of the evaluation was to assess the conservation value of the project with respect to the recovery and conservation of reptile species at risk by examining the project's outcomes. Another aim was to address any lessons learned or needed improvements in the project's operations. The evaluation was conducted for the benefit of a variety of interest groups: project staff, conservation practitioners, volunteers, project partners, funders and the general public. LPBLT engaged an outside evaluator to coordinate and lead the evaluation, while project staff participated in the design, data gathering and overall assessment.

The evaluation was organized around the four main project strategies: human impact mitigation; habitat enhancement; outreach, awareness and education; and, surveys and monitoring. Four specific questions corresponded with these strategies: 1) Has the project resulted in human impact mitigation for listed species of reptiles in the project region?; 2) Have the habitat enhancement activities resulted in use by reptiles and is there evidence of enhanced use or survival based on design?; 3) As a result of the project, are participants more knowledgeable, more supportive and more active in the conservation and recovery of reptiles?; and, 4) Have the reptile monitoring and reporting methods improved the knowledge base for listed species of reptiles in the region?

Based on the analysis of indicators within each category, the evaluator concludes that, after five years, the Conserving Carolinian Reptiles project has made substantial progress towards each of its goals and has successfully achieved its intended short-term outcomes as well as most of its intended mid-term outcomes. The project has been successful in human impact mitigation through the protection of hundreds of reptiles annually, including an 82% mortality reduction following installation of seasonal barrier fencing at Long Point Provincial Park. In addition, the constructed habitats are showing signs of use by turtles and snakes, including species at risk. The project shows promise of additional future accomplishments as the project expands and matures. The project is being run by knowledgeable and dedicated staff who received high praise from the landowners, partners and contractors interviewed.

The evaluation included a telephone survey of targeted participants with the objective of assessing changes in knowledge, attitudes and conservation actions after participating in the project. Results suggest that the project is very effective at engaging local landowners in conservation actions and in increasing their knowledge about reptiles. The report contains many quotes from the 20 interviewees who participated in the survey, as well as photographs and samples of project materials. Over the project's first five years, 343 participants have submitted records of 4,411 reptiles, including 2,078 species at risk, illustrating that the initiative is improving the knowledge base of reptiles in the region.

The evaluation found few areas needing improvement, but offered suggestions for some areas where the project might focus its resources and energy during the years ahead. For instance, more effort could be given to gathering data that would provide convincing evidence of the beneficial impact of habitat enhancements and direct mitigation measures. Another suggestion would be to explore ways of reaching new audiences, especially large scale farms and groups of citizens who might not share the same interest and concern for reptiles that project participants have demonstrated. The evaluation concludes that the Conserving Carolinian Reptiles project is a worthwhile and effective multi-species, multi-faceted conservation project and that LPBLT, project partners and funders give it their full support.

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Eastern Hog-nosed Snake Photo: Gregor Beck

## **1.0 INTRODUCTION**

### **1.1 Overview**

The Conserving Carolinian Reptiles project is a core initiative of Long Point Basin Land Trust (LPBLT), a charitable non-governmental organization which works with landowners, partners and volunteers to protect and restore valuable lands, including the species and habitats that occur there. The project, envisioned in 2008 and begun in 2009, has run continuously for over five years and has evolved to become a flagship project of LPBLT. The project director is Gregor Beck, an experienced conservation biologist and senior consultant to LPBLT, who initiated the project and developed the strategies, activities and most informational products. He has been assisted by consulting biologists over the course of the project, including Matt Timpf, Jeremy Hatt, and for the last three years, Adam Timpf.

The project was undertaken with the assistance/financial support of: The Government of Canada through the federal Department of the Environment (Habitat Stewardship Program for Species at Risk), The Government of Ontario (Ontario Ministry of Natural Resources' Species at Risk Stewardship Fund); Fred Eaglesmith Annual Charity Picnic; HIVA Environmental Fund; The John & Pat McCutcheon Charitable Foundation; The McLean Foundation; and, individual donors.

In 2012, the project director and LPBLT decided that an evaluation of the project during its fifth year of operation should be undertaken. The purpose of the evaluation would be to assess project effectiveness with respect to the recovery and conservation of reptile species at risk in the Carolinian region and in engaging the public in conservation activities. With a focus on outcomes, i.e. changes or benefits that result from project activities, the evaluation would be of interest to funders and decision-makers of conservation policy who seek evidence that recovery objectives for at-risk species are being met and that funds are being well spent.

It was equally important that the evaluation be useful to staff, volunteers and conservation practitioners engaged in similar conservation and recovery activities, especially for species at risk. It was hoped, therefore, that lessons and recommendations would emerge from the study which might be shared with the conservation community. Such formative or process-oriented focus is essential to improving the practice of conservation more generally and should be a regular part of every project's scheme of planning.

LPBLT chose an evaluation approach that would examine both the project's conservation outcomes after five years *and* its operations. The evaluation was to be conducted for the benefit of a variety of interest groups: project staff, conservation practitioners, volunteers, project partners, funders and the general public. LPBLT engaged an outside evaluator to coordinate the evaluation and specified that project staff and volunteers would participate in the design, data gathering and assessment. The evaluation took place during fall and winter 2013-2014, and this report documents its results.

### **1.2 Objectives, Scope and Limitations of the Evaluation**

The evaluation of the Conserving Carolinian Reptiles project asks the basic question, "Is the project meeting its intended conservation outcomes?" In addition, due to the ongoing nature of the project and that the strategies taken are common to several conservation initiatives, the evaluation also examines what lessons might be learned from the strategies and techniques implemented.

The first question helps answer how valued and worthwhile the project has been from a conservation perspective. By focusing on the results to date, it helps the project proponent, its partners and funders to determine whether to invest in continued efforts going forward. The second question addresses the more practical operations which, in the case of the Conserving Carolinian Reptiles project, evolve and are shaped by an adaptive management approach rather than by a fixed theoretical or formulaic style.

The evaluation examines the project's outcomes as organized within four major project strategies: human impact mitigation; habitat enhancement; outreach, awareness, and education; and, surveys and monitoring. The evaluation asks four questions, each one corresponding to a project strategy:

1. Has the project resulted in mitigation of harm to listed species of reptiles in the project region?
2. Have the habitat enhancement activities resulted in use by reptiles? Is there evidence of enhanced use or survival based on design?
3. As a result of the project, are participants more knowledgeable, more supportive and more active in the conservation and recovery of reptiles?
4. Have the reptile monitoring and reporting methods improved the knowledge base for listed species of reptiles in the region?



Blanding's Turtle (L) with Midland Painted Turtle (R). The goals of the project include the recovery of species at risk, as well as the stewardship of reptile species and habitat in general. Photo: Joe Crowley

To answer the four questions fully would involve a comprehensive evaluation over an extended period of time, involving the acquisition of baseline data and comparisons with performance-based criteria. Proof of the actual contribution of the program towards the stated goals would involve a complex analysis of social, economic and ecological factors; this is beyond the scope of this study and rare among conservation projects of this scale. However, it is feasible and desirable to ascertain the relative degree of progress the project is making towards its intended outcomes during a brief evaluation period.

There are two important limitations of this study. One is the lack of comprehensive baseline data about reptile species populations and distributions in the Long Point Basin area (and provincially) which limits the ability of the project staff to measure population and distribution changes as a result of this project. Second, it is not feasible to determine the precise use and occupancy of the snake hibernacula or turtle nesting habitats without causing extensive disturbance to the structures themselves. This creates uncertainty over the effectiveness of such structures – a challenge that might be overcome in time with the development of low-cost monitoring devices which could be adapted for this purpose. In the meantime, determining the occupancy and use of habitat structures relies upon documented occurrences during monitoring, opportunistic sightings by landowners or volunteers, and the opinions of project staff and volunteers.

### **1.3 Organization of the Report**

Following Sections 1 (Introduction), 2 (Project Overview), and 3 (Methodology), the report begins the analysis of the project. Section 4 (Analysis of Project Outcomes), examines first the outcomes by project strategy and then the overall results. The overall results are grouped into four important themes: project goals or impact, public engagement, sustainability and possible weaknesses. Section 5 describes some of the Lessons Learned, which may be of beneficial use to other conservation projects. Section 6 (Conclusions) and Section 7 (Recommendations) form the remainder of the report, along with Appendices. Quotes from project participants and photographs appear throughout the report, giving life to the evaluation and insight into its impact.



Engaging diverse audiences in reptile conservation and monitoring; Autumn Eco-Fest & Hawkwatch, co-hosted annually with Long Point Eco-Adventures. Photo: Gregor Beck

## **2.0 CONSERVING CAROLINIAN REPTILES: PROJECT OVERVIEW AND PARTNERS**

The Conserving Carolinian Reptiles Project was launched in 2009 as a project of Long Point Basin Land Trust (LPBLT), a charitable non-governmental organization which protects and restores important natural habitats in the Carolinian Region. LPBLT promotes conservation through land securement, stewardship, habitat restoration and species at risk recovery efforts. The LPBLT owns and stewards five nature reserve properties in Norfolk County, totaling 350 acres. (For further information about other aspects of LPBLT's conservation work, please visit their website at: [www.LongPointLandTrust.ca](http://www.LongPointLandTrust.ca).)

The project takes place across LPBLT's geographic range in the central Carolinian Region along Lake Erie's north shore, including Norfolk County, western Haldimand and eastern Elgin Counties, as well as adjoining portions of Brant and Oxford Counties. The project engages the collaboration of numerous diverse partners which contribute in various ways. They include the following groups: Bird Studies Canada/Long Point Bird Observatory, Hamilton Naturalists' Club, Long Point Eco-Adventures, Long Point Region Conservation Authority, Long Point World Biosphere Reserve Foundation/Long Point Causeway Improvement Project, Nature Conservancy of Canada, Nature's Calling Environmental Education, Norfolk County, Norfolk Field Naturalists, Ontario Ministry of Natural Resources, Ontario Nature, Otter Valley Naturalists' Club, Scales Nature Park, Scienstational Ssnakes!!, Six Nations of the Grand River Territory/Kayanase, St. Williams Conservation Reserve Community Council and The Sticky Tongue Project. In addition, the project reaches out to more general audiences in the area through outreach programs and special events, such as the Fred Eaglesmith's Annual Charity Picnic, woodlot owners' association meetings, public presentations, training workshops, and community events including LPBLT's annual Autumn Eco-Fest weekend. Outreach activities also include extensive resource materials and videos and use of social media. A brief project summary can be found in Appendix A.

### **2.1 Goals, Objectives and Strategies**

The goals of the Conserving Carolinian Reptiles project are 1) the recovery and conservation of reptile species at risk and their habitats within the Long Point Basin; and 2) the development of an informed, concerned citizenry which participates actively in recovery and conservation efforts. Over the five-year period, the objectives have remained fairly constant, with the increasingly active involvement of volunteers and landowners in site-specific habitat enhancement and recovery efforts. The project's five objectives, as stated in a final report for 2012-2013, are as follows:

1. to reduce human-induced mortality of reptiles in the Long Point Basin;
2. to create and monitor on-the-ground habitat enhancement projects;
3. to raise awareness about reptiles, their population status and trends, and recovery efforts in a targeted fashion;
4. to implement and expand region-wide surveys of reptiles with multiple partners; and,
5. to engage landowners in site-specific recovery efforts and documentation of current/ historic records.

The project staff and advisors understand that such an ambitious project which seeks positive change in reptile populations and in public knowledge, attitudes and actions will take years of effort. For this reason, the project director has envisioned the project with an adaptive management and long-term approach.

The project adopts a multi-species, multi-faceted conservation approach, employing four distinct strategies aimed at reducing threats to reptiles and engaging the public in conservation and recovery. A wide variety of activities are organized within these strategies. The strategies are as follows:

- (1) Human Impact Mitigation. The project addresses direct mortality mitigation by removing reptiles from direct and imminent harm and coaching others to do the same. Examples include helping snakes and turtles across the roads and rescuing them from entrapments.
- (2) Habitat enhancement. The project is a leader in the construction of reptile habitats, e.g. snake hibernacula, turtle and snake nesting habitats, and other turtle and snake habitat enhancements. It partnered with Long Point Provincial Park on the construction of a road barrier to prevent vehicle strikes of reptiles. Activities include monitoring of habitats and structures.
- (3) Outreach, awareness and education. The project conducts the following targeted outreach: a. landowners – species at risk and reptile habitat enhancement; b. cottagers, campers and people engaged in horticultural activities – how to reduce mortality; and c. conservation professionals – reptile conservation measures. The project also conducts outreach to more general audiences through web sites, presentations, events, publications and videos.
- (4) Surveys and monitoring. The project organizes public reporting of reptile observations, volunteer road surveys, and targeted professional surveys. It also conducts monitoring of road barriers and constructed reptile habitats, e.g., snake hibernacula and nesting boxes.

## 2.2 Rationale and Context

The Long Point Basin, considered one of the most biologically diverse areas of Canada, lies within the Carolinian region of Ontario – a region containing one of the highest concentrations of species at risk in Canada. The Long Point Basin contains a high proportion of natural habitats relative to other parts of the Carolinian region, including essential habitat for numerous species at risk. These features make the Long Point Basin an excellent place to invest in multi-species recovery efforts and habitat protection.

Of note, the Long Point Basin is a major refuge for reptiles. Nineteen reptile species occur within the Long Point Basin, of which 12 are designated at risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Committee on the Status of Species at Risk in Ontario (COSSARO). Of these, four are *endangered*, three are *threatened* and five are *special concern*. Six of the seven native turtle species are currently at risk, including the formerly common Snapping Turtle. One-half of the dozen snake species are listed at risk. Table 1 lists the reptile species found within the Long Point Basin, plus their status according to COSEWIC and COSSARO.



The Long Point Basin, centred on Long Point (above), includes Norfolk County, eastern Elgin, western Haldimand and parts of Oxford and Brant Counties. Photo: Gregor Beck

**Table 1: Reptile species occurring in the Conserving Carolinian Reptiles project area of Long Point Basin, Ontario.**

Common Name	Scientific Name	COSEWIC* Status	COSSARO* Status
<b><u>Turtles</u></b>			
Spotted Turtle	<i>Clemmys guttata</i>	Endangered	Endangered
Spiny Softshell	<i>Apalone spinifera</i>	Threatened	Threatened
Blanding's Turtle	<i>Emydoidea blandingii</i>	Threatened	Threatened
Eastern Musk Turtle	<i>Sternotherus odoratus</i>	Threatened	Threatened
Northern Map Turtle	<i>Graptemys geographica</i>	Special Concern	Special Concern
Snapping Turtle	<i>Chelydra serpentina</i>	Special Concern	Special Concern
Midland Painted Turtle	<i>Chrysemys picta marginata</i>		
<b><u>Snakes</u></b>			
Gray Ratsnake	<i>Pantherophis spiloides</i>	Endangered	Endangered
Eastern Foxsnake	<i>Pantherophis gloydi</i>	Endangered	Endangered
Queensnake	<i>Regina septemvittata</i>	Endangered	Endangered
Eastern Hog-nosed Snake	<i>Heterodon platirhinus</i>	Threatened	Threatened
Milksnake	<i>Lampropeltis triangulum</i>	Special Concern	Special Concern
Eastern Ribbonsnake	<i>Thamnophis sauritus</i>	Special Concern	Special Concern
Eastern Gartersnake	<i>Thamnophis sirtalis</i>		
DeKay's Brownsnake	<i>Storeria dekayi</i>		
Red-bellied Snake	<i>Storeria occipitomaculata</i>		
Northern Watersnake	<i>Nerodia sipedon sipedon</i>		
Smooth Greensnake	<i>Opheodrys vernalis</i>		
Northern Ring-necked Snake	<i>Diadophis punctatus</i>		

\*COSEWIC = Committee on the Status of Endangered Wildlife in Canada; COSSARO = Committee on the Status of Species at Risk in Ontario

With a high concentration of reptiles and other species at risk, and with among the greatest concentration of remaining natural habitats in the Carolinian Region, the Long Point Basin is understandably a high-priority area for conservation and recovery efforts for species at risk.

An important task in conservation and recovery efforts is being able to accurately identify the high priority threats that are known or likely to be causing limits to the effective recovery of depleted populations. In this case, factors negatively affecting reptile populations in the Long Point Basin area have been identified. The Conserving Carolinian Reptiles project has been addressing several of these threats, the most important of which may be described as follows:

- intentional and unintentional anthropogenic mortality (e.g., vehicle or machinery strikes, predation by introduced or over-populated predators or pets);
- lack of safe and suitable nesting and wintering habitats for at-risk reptiles;

- pertinent knowledge gaps about listed species' ranges and populations (such gaps limit effective recovery strategy planning); and,
- continued threats from members of the public who do not appreciate, value and/or tolerate species at risk or reptiles.



Road mortality remains a major threat to turtles, snakes and other wildlife. The loss of mature female turtles from the breeding population is of particular concern. Left: Blanding's Turtle (photo: Scott Gillingwater). Right: Snapping Turtles (Photo: Gregor Beck)

### 2.3 Project Framework and Description of Activities

Effective conservation and recovery projects depend on the ability to identify appropriate outcomes that are specific, measurable, achievable, realistic and timely (S.M.A.R.T) and to develop strategies aimed at achieving the intended outcomes. The project staff identified appropriate project outcomes on the basis of available knowledge that exists for reptiles in the region and across Canada. They drew from recovery strategies and action plans, response statements, species assessments and status reports, scientific literature, and by consulting with jurisdictional species experts and members of recovery teams. They combined this knowledge with years of expertise in running conservation projects and wildlife atlassing that involved intensive field work, communications with landowners, educating targeted audiences and producing information materials. Project staff then developed a set of activities that would lead to the intended project outcomes. They organized the project activities around the four basic strategies described in Section 2.1.



The secretive Red-bellied Snake is well camouflaged amongst autumn oak leaves. Photo: Gregor Beck

## 3.0 METHODOLOGY

### 3.1 Evaluation Approach

The evaluator followed the general principles for the evaluation of species conservation and recovery projects described in a document produced by Intervale Associates (2012), *Improving the Practice of Stewardship: An Introduction to Evaluation*. She developed the specific approach for this project in consultation with the project director and staff, and adapted it to the available resources and timetable. She organized the evaluation according to the four main strategies, with a separate question corresponding to each strategy. A major component of the evaluation was the assessment of change in knowledge, attitudes and actions by individuals who had served voluntarily in various capacities for the project. Table 2 outlines the basic structure and organizational plan of the evaluation.

### 3.2 Research Tools and Methods

The evaluator reviewed project reports, updates, proposals, and information materials. She interviewed a sample of volunteers and staff and, with the assistance of an associate, analyzed and reported on the results. She reviewed a database of reptile observations by staff, volunteers and the public, which staff had generated over five years. She also reviewed staff records describing the habitat enhancements as well as monitoring information. The research tools and methods are grouped by strategy below:

Human impact mitigation. The evaluator examined the project database prepared by staff, which identified the location and dates of mitigation data. These data comprised results of road surveys conducted by project staff and volunteers, as well as results of annual monitoring of the reptile barrier fencing erected within Long Point Provincial Park. In addition, interviews with project volunteers and partners provided information relating to human impact mitigation.

Habitat enhancement. The evaluator examined the project database prepared by staff, which identified the location and use of constructed habitats (snake nesting structures and hibernacula, and turtle nesting sites), or other habitat enhancement (e.g., pine plantation thinning, creation of open areas for basking, log additions and other structural adaptations). She reviewed instructional videos and information materials that the project had produced concerning habitat enhancement.

Outreach, awareness and education. In order to measure change in the knowledge, attitudes and actions of project participants, the staff and evaluator collaborated in organizing a telephone survey during which the evaluator asked a sample of participants a series of closed and open-ended questions.

The survey had as its target 20 participants. Project staff selected the participants from a database of volunteers, including landowners and reptile surveyors, and other participants such as contractors involved in the habitat enhancement projects. Criteria used in selecting the participants consisted of: 1) involvement in the project for a minimum of three years; 2) general understanding of the project objectives and activities; and 3) relatively easy to reach for an interview.

**Table 2. Evaluation Plan: Conserving Carolinian Reptiles**

<b>1. FOCUS</b> What progress has been made in the four major project components after five continuous project years, 2009-2014.						
<b>2. QUESTIONS</b>	<b>3. INDICATORS- EVIDENCE</b>	<b>4. TIMING for data collection</b>	<b>5. DATA COLLECTION</b>			
			<b>SOURCES of information</b>	<b>METHODS for data gathering</b>	<b>SAMPLING</b>	<b>INSTRUMENTS or tools</b>
<b>1.</b> Has the project resulted in mitigation of harm to listed species of reptiles in the project region?	1.a. Lower mortality by vehicles 1.b. Fewer snakes documented on road in high risk areas, following installation of fencing 1.c. Fewer accidents caused by domestic field and garden equipment	Throughout the active season (spring through fall).	Volunteers, staff, road surveyors, partners. Collected into database by project staff.	Data collection by road surveyors following established protocols. Web and telephone based reporting. Staff/partner data collection	Staff, based on database of observations.	Database of observations.
<b>2.</b> Have the habitat enhancement activities resulted in reptile use? Is there evidence of enhanced use or survival based on design?	2.a. Monitoring results, including records of both confirmed and potential use.	Throughout the active season (spring through fall).	Landowners, contractors, park staff and other participants.	Observation within, on and nearby. Depth and substrate create barriers to observation.	Staff, park staff, landowners, contractors, and others.	Special probes, other approaches are being investigated; work limited by depth.
<b>3.</b> As a result of the project, is the public in the region more knowledgeable, more supportive of recovery and conservation actions for reptiles, and more active in recovery and conservation?	3.a. Increased number and quality of reports from volunteer observers. 3.b. Increased volunteer numbers and sustained participation in all activities. 3.c. Increased knowledge, willingness to participate, and active participation, as indicated by results of volunteer survey. 3.c. Increased number and quality of media stories, requests for assistance, and invitations to speak.	All year long.	Volunteers, project partners, and staff.	Volunteer survey. Databases created from volunteer reports. Records of stories in the media. Number of web site and telephone reports.	Sample of volunteers.	Telephone survey.
<b>4.</b> Have the reptile monitoring and reporting methods improved the knowledge base for listed species of reptiles in the region?	4.a. Number of reptile reports by species. Staff confirmation. New species confirmed for the region. 4.b. Enlarged geographic distribution for species, greater number of known occurrences, or more widespread occurrence.	All year long.	Project staff	Observation and reporting by web, telephone, and in person, followed by analysis by staff.	Staff, volunteers, and resource experts in Ontario.	Mapping and atlas resources showing distribution of listed species.

Project staff drafted the questionnaire in consultation with the evaluator, who provided further editing. Questions were formatted onto a two-page questionnaire (Appendix B). The evaluator pre-tested the survey tool for question wording and length. It was determined that the questionnaire took approximately ten minutes to administer. She recommended no changes to the question wording.

Project staff contacted the participants ahead of time to request permission to be interviewed, to describe the objectives of the survey and the person who would be administering it, and to explain how the results would be used. The evaluator contacted the participants by telephone, conducted the interview, recorded the responses on paper, and transcribed the responses into digital format and a database, after which she and an evaluation associate tallied the responses and presented the results.

In addition to the survey, the evaluator reviewed the print and web-based information materials and videos for their content, format, style and educational value. She also reviewed a sample of news media reports and event announcements, including articles about the project that had appeared in local and regional newspapers and in the seasonal tabloid produced by Long Point Provincial Park.

Surveys and monitoring. The evaluator examined the database of reptile reports generated by project staff between 2009 and 2013 for the Long Point Basin and nearby project area. These data were summarized into tables which appear in Section 4.

### **3.3 Data Summary and Analysis**

Since the project staff had already summarized data which had been gathered for human impact mitigation, habitat enhancement, and surveys and monitoring, no further summary of these data was needed. For data that had been gathered from the survey of participants, the evaluator and an associate created a database of responses by interviewees to each question. The evaluators tallied these data and presented the results in the form of text, tables and figures. They organized responses to the open-ended questions by grouping them according to topic and examining their content for repetition and emphasis. At the conclusion of the evaluation, LPBLT was presented with the original copies of completed questionnaires, the database of responses and the responses to open-ended questions.

For each of the four project strategies, the evaluator summarized the results and their relationship to project inputs, outputs and intended outcomes. She then compared the results, i.e. actual outcomes, with the intended outcomes and assessed the progress towards the eventual achievement of the project's long-term goals.

## 4.0 ANALYSIS OF PROJECT OUTCOMES

The results are presented below and grouped according to strategy.

### 4.1 Human Impact Mitigation

Mitigation data are presented in a descriptive fashion, based on comments and feedback from staff, local biologists, and project participants and landowners. Human impact mitigation analyses were also made by reviewing statistics from LPBLT's reptile road survey and other data. In addition, an attempt was made to quantify mitigation impact by examining data from the monitoring of the reptile barrier fencing, installed by LPBLT and Long Point Provincial Park in spring 2011.

The following comment provides a qualitative example of the impact of project activities:

*We have one [snake] that my neighbor wanted to kill because they thought it was a Massasauga (Rattlesnake). It was a water snake. Another neighbor thought a Milksnake was a rattler. My actions have helped prevent harm to these. (landowner/participant)*

According to staff, the number of reptiles spared from vehicle strikes likely has increased as a result of this (and related conservation) projects because more people who use local roads on a regular basis were aware of the conservation issue and had taken steps to alter their driving behaviour so as to prevent such strikes. Many conservationists working in the region agree that it appears more people (including project participants), upon seeing reptiles in the road, have taken actions to assist them in crossing safely. Other evidence relating to the project's successful human impact mitigation came from the personal accounts of Long Point residents, park staff and regular visitors who have all commented on reduced mortality subsequent to the installation of the seasonal barrier at Long Point Provincial Park.



Eastern Foxsnake on roadway  
Photo: Joe Crowley



Monitoring barrier fencing, Long Point Provincial Park  
Photo: Gregor Beck

Road surveys and reptile reporting efforts conducted as part of the project also provide an opportunity to estimate the impact of the project in reducing mortality. As part of their interest in reducing reptile mortality, observers who encounter a turtle or snake on a roadway invariably try to ensure that the animal(s) get safely off roads – avoiding what would otherwise be almost certain death or injury. The following table summarizes the reptiles that were reported as being seen alive on a roadway and which are known or presumed to have been removed from direct harm as a result of project activities. This provides a further estimate of impact of the project in protecting species at risk and non-listed reptiles.

**Table 3. Reptiles encountered live on roadways by LPBLT project surveyors, 2009-2013, and known or presumed to have been protected through project activities.**

Species	Status	2009	2010	2011	2012	2013	Total
Eastern Foxsnake	Endangered	1	3	5	2	9	20
Gray Ratsnake	Endangered	1	0	1	1	0	3
Spotted Turtle	Endangered	0	2	5	1	2	10
Blanding's Turtle	Threatened	2	6	25	7	13	53
Eastern Hog-nosed Snake	Threatened	0	0	0	1	1	2
Northern Map Turtle	Special Concern	0	1	5	5	13	24
Snapping Turtle	Special Concern	1	5	47	3	69	125
DeKays's Brownsnake		9	40	16	2	2	69
Eastern Gartersnake		6	39	16	8	14	83
Midland Painted Turtle		1	6	17	1	9	34
Northern Watersnake		0	0	0	1	0	1
Red-bellied Snake		0	0	2	0	1	3
<b>Species at Risk Total</b>		5	17	88	20	107	237
<b>Total</b>		21	102	139	32	133	427

The seasonal reptile barrier installed by LPBLT and Long Point Provincial Park has reduced mortality in a priority “hot spot” which was fenced in spring 2011. The 750-metre stretch of roadway inside the park had been documented by volunteers and staff of LPBLT and the park as a major problem area, most notably for snakes on busy fair-weather weekends in late September and early October. In fall 2010, warm days and cool nights occurred during the Thanksgiving long weekend, leading to high frequency of snakes on park roadways at a time when visitor traffic was also high. That weekend, 181 snakes were documented on this section of park roadway, of which 80% were found dead; this total also included one live and six dead Eastern Foxsnakes. (Additional mortality had been reported throughout the summer, but this was the worst incidence of mortality in the year.) Responding to this significant threat, LPBLT and the park worked together to seek funds to purchase and install seasonal barrier fencing. (Note: since the park is closed to the public from Thanksgiving to mid-May, sections of fence (or “gates”) are opened to allow seasonal wildlife movements during the “off season.”)



Eastern Gartersnake and Northern Map Turtle protected by Long Point Provincial Park barrier. Photos: Gregor Beck

The impact of the fencing was evident almost immediately. Park and LPBLT staff monitoring the site have documented significant reductions in mortality of both turtles (nesting and hatching season) as well as snakes in autumn (when snakes used the park road for basking).

*"The mortality definitely decreased." (Long Point Park staff, on the benefit of the barrier)*

**Table 4. Reduction in incidence of reptiles on Long Point Provincial Park road through annual Thanksgiving weekend monitoring, from 2010 (before fencing was installed) to 2013.**

	<b>2010</b> (Pre-fencing)	<b>2011</b> (Post-fencing)	<b>2012</b> (Post-fencing)	<b>2013</b> (Post-fencing)
Total number of reptiles (all snakes) documented on road within the identified high mortality zone	<b>181</b>	<b>71</b>	<b>19</b>	<b>11</b>
Number and (%) found dead	<b>146</b> (80% dead)	<b>54</b> (76% dead)	<b>19</b> (100% dead)	<b>11</b> (100% dead)
Number of species at risk	<b>7</b>	<b>1</b>	<b>1</b>	<b>0</b>
% reduction in number of reptiles (all snakes) documented on road since fencing was installed	---	<b>61%</b>	<b>90%</b>	<b>94%</b>
Weather	Very fair autumn weather with warm days and cold nights – highly conducive to reptile basking and high vehicle traffic.	Fair weather with warm days and cool nights – highly conducive to reptile basking and high vehicle traffic.	Very cool autumn weather with cool days and cool nights – not very conducive to reptile basking; lower vehicle traffic.	Fair weather with warm days and cold nights – highly conducive to reptile basking and high vehicle traffic.
Notes	Identification of serious problem by volunteers and staff; interim measures (info for visitors) to help reduce mortality had limited impact.	Fencing installed June 2011; problem encountered during Thanksgiving 2011 weekend with part of fencing left open (leading to increased mortality that weekend).	Significant reduction in mortality observed throughout the year; observations on Thanksgiving biased (low) because of cold weather.	Significant reduction in mortality observed throughout the year; fair weather on Thanksgiving weekend gives good comparison of road mortality change.

Taken together, the reduction in mortality as a result of the Long Point Provincial Park seasonal barrier, the documentation of reptiles protected on roadways, as well as testimony from volunteers interviewed and personal accounts from project staff form a sufficient body of evidence to state that the Conserving Carolinian Reptiles project has resulted in significant mitigation of harm to listed species of reptiles in the project region. If one were to extrapolate from the limited periods of monitoring, the number of reptiles being protected each year from direct harm as a result of the project may be estimated conservatively in the hundreds.

## 4.2 Habitat Enhancement

In the five years since the project began, staff have worked with landowners, contractors, partners and Long Point Provincial Park to implement a total of 60 habitat enhancement structures or techniques. The number of installations or applications, by habitat enhancement type, are listed in Table 5.

**Table 5. Type and quantity of habitat enhancements implemented by the Conserving Carolinian Reptiles Project, in conjunction with partners, from 2009-2013.**

Habitat Enhancement Type	No. of Installations or Use
Snake Nesting Boxes	27
Hibernacula	15
Turtle Nesting Sites	15
Pine Plantation Thinning	2
LPPP* Barrier Fencing (750m priority zone)	1
<b>Total</b>	<b>60</b>

\*LPPP=Long Point Provincial Park

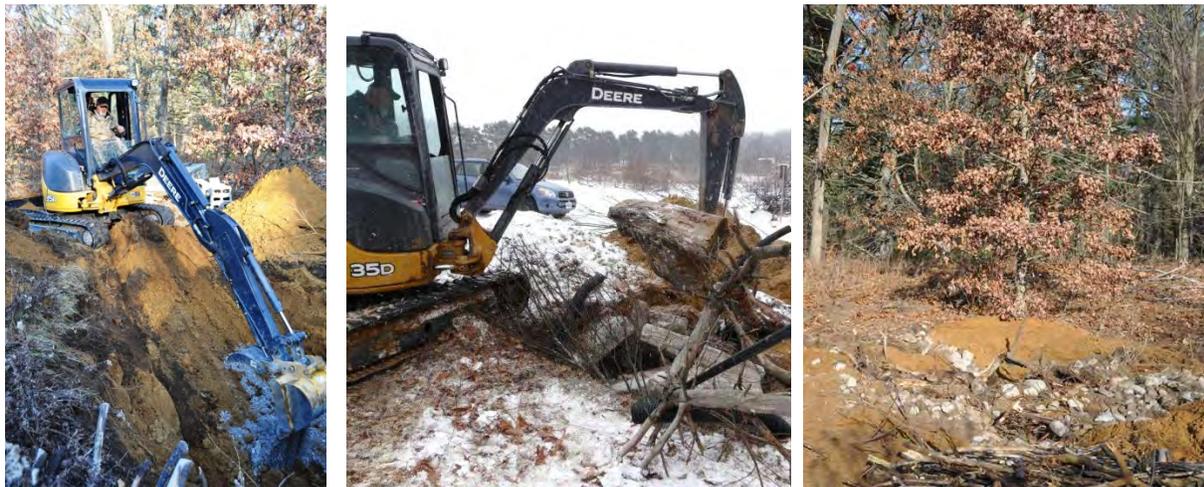
Monitoring the occupancy and use of constructed habitats and other reptile habitat enhancements has proved challenging. Without sophisticated monitoring devices, it is not possible to examine the occupancy of a snake hibernacula or turtle or snake nesting structures without causing damage or harm to the site. Furthermore, a hibernaculum is typically quite deep (c. 2 metres), at a depth near the winter water table. Without sophisticated means of examining a site *without harm* to the habitat, the project staff had to rely principally upon observational data from around the site in order to gather evidence of the possibility that the site was being used. For hibernacula, early spring and fall monitoring is particularly helpful, whereas with turtle or snake nesting structures, the preferred monitoring seasons are early summer (nesting) and late summer/fall (peak of hatching).

Of the 27 snake nesting boxes established on properties throughout the project area, staff recorded seven observations of snakes near the box, on the property or nearby. Significantly, two different cooperating landowners documented occurrences of the endangered Eastern Foxsnake in constructed nest boxes – from two very distant parts of the project’s operating region. In one case (2011; see photo), the Foxsnake was observed in the nesting structure during egg-laying season and a photo was obtained. At another location, a landowner heard the vibrating “rattle-like” sound of what is presumed to be an Eastern Foxsnake (based on location and previous sightings at site) inside the nesting structure during the 2013 summer season. Another landowner has reported sightings of Milksnake and numerous other snake species (Eastern Gartersnake, Red-bellied Snake, DeKay’s Brownsnake) in the immediate vicinity of nest boxes – with Gartersnakes sometimes basking inside the structure. While no hatching events for oviparous (i.e. egg-laying) snakes have been observed directly, the chance of such a sighting would be extremely rare. In several additional cases, LPBLT project participants have documented nesting by oviparous snakes in mulch or wood chip piles on their properties, including Milksnake, Eastern Foxsnake and, possibly, Gray Ratsnake. These participants have since become intimately involved in LPBLT’s reptile conservation project.



LPBLT Species at Risk Biologist, Adam Timpf, constructing a snake nesting structure. The following summer (2011), an adult Eastern Foxsnake was observed by the landowner inside the nesting structure: Photos: Gregor Beck (L) and contributed photo (R).

Of the 15 snake hibernacula constructed, staff and cooperating landowners have recorded several observations which indicate confirmed and possible use of the sites. The first hibernaculum constructed by LPBLT staff is the most intensively monitored site. The hibernaculum on this property has been checked almost daily throughout the active season since the first spring following construction in 2010. LPBLT staff have confirmed that the hibernaculum is being used regularly in winter (based on observations of over one dozen snakes in early spring and late fall) as well as in summer as a presumed refuge from extreme heat. Three species of snake (no species at risk to date) have been observed using the hibernaculum: Eastern Gartersnake (both striped and melanistic forms), DeKay's Brownsnake and the locally uncommon Red-bellied Snake. At another location, an adult Milksnake, DeKay's Brownsnakes, and Eastern Gartersnakes have been observed under a board near a constructed hibernaculum. At other sites, LPBLT staff have documented these species, as well as Milksnake and Eastern Hog-nosed Snakes, in the vicinity of constructed hibernacula (within c. 100 to 150m), suggesting at least potential use.



Creation of snake hibernacula includes excavation to a depth of two to three metres, followed by construction of a series of interconnected, underground crevices and chambers. Completed structure is well concealed at the surface. Photos: Gregor Beck



DeKay's Brownsnake (left); Eastern Gartersnake (right) entering hibernaculum constructed by LPBLT. Photos: Gregor Beck

Of 15 turtle nesting sites, there have been six recorded observations of turtle occurrence on constructed habitats. These included observations by several observers of Snapping Turtles excavating on nest mounds, as well as documentation by other project partners of a Blanding's Turtle on a constructed nest. Of two locations where LPBLT undertook thinning of pine plantations to create more suitable savanna habitat, staff recorded observations of reptiles at each location: one with a Snapping Turtle nest in 2013 and an Eastern Gartersnake in 2011; the other with Snapping Turtle nests in multiple years. Significantly, there have been two Eastern Hog-nosed Snake sightings in openings created within pine plantations – this threatened reptile is a target species for this habitat enhancement and such sightings are encouraging. In addition, there have been observations of Eastern Gartersnakes in these clearings.



Construction of a turtle nesting habitat in cooperation with local landowner. Habitat enhancements for turtles may include nest site creation, as well as re-grading the steep banks of former irrigation ponds and installation of log basking habitat. The siting of constructed habitats aims to reduce anthropogenic mortality risks for adults and hatchling. Photos: Gregor Beck

**Table 6. Monitoring results for habitat enhancements undertaken by the Conserving Carolinian Reptiles Project.**

Habitat Enhancement	Site	Evidence of Use by Reptiles
Long Point Provincial Park Fencing (750m)	19	Confirmed impact: fencing has lowered road mortality in fenced area by c. 80% or more
Hibernaculum	5	Confirmed use: three species of snake seen regularly throughout active seasons (Eastern Gartersnake, Red-bellied Snake, DeKay's Brownsnake), 2010-2013.
Hibernaculum	17	Potential use: Milksnake observed within 150m of hibernaculum, 2011

<b>Habitat Enhancement</b>	<b>Site</b>	<b>Evidence of Use by Reptiles</b>
Hibernaculum	31	Potential use: Eastern Gartersnake in immediate vicinity of hibernaculum, 2013
Hibernaculum	14	Potential use: Milksnake, Eastern Gartersnake and DeKay's Brownsnake observed basking near site.
Oak-pine savanna restoration (thinning of pine plantation)	16	Confirmed use: Eastern Gartersnake observed, 2011; Snapping Turtle nest, 2013
Oak-pine savanna restoration (thinning of pine plantation)	25	Confirmed use: Eastern Hog-nosed Snakes (2) seen in created openings, as well as Eastern Gartersnake; Snapping Turtle nests, multiple years.
Snake Nesting Box	2	Confirmed use: Eastern Foxsnake seen exploring nest box in nesting season, in June 2011 (photo taken); regular (annual) reports of Foxsnake at property.
Snake Nesting Box	7	Confirmed use: Eastern Foxsnake inside nest box (heard), 2013; additional visual report at property, 2013.
Snake Nesting Box	8	Potential occurrence/use: roadkill Gray Ratsnake adjacent to site, 2012.
Snake Nesting Box	24	Potential occurrence: Eastern Foxsnake laid eggs in woodchip pile, 2012.
Snake Nesting Box	26	Potential occurrence/use: regular sightings of Eastern Foxsnakes on property (photos).
Snake Nesting Box	33	Potential occurrence/use: regular sightings of Eastern Foxsnakes on property.
Snake Nesting Box	14	Potential occurrence/use: Milksnakes seen in vicinity of nest box, plus numerous Eastern Gartersnake, DeKay's Brownsnake and Red-bellied Snake.
Turtle Nesting Site	13	Confirmed use: Snapping Turtle seen on constructed turtle nesting site, May 2012; Milksnakes have nested and over-wintered in composter/nest box.
Turtle Nesting Site (x2)	11	Confirmed use: Midland Painted Turtles observed in pond (on installed logs), subsequent to multiple LPBLT habitat enhancements
Turtle Nesting Site (x2)	18	Confirmed occurrence/use: Blanding's Turtle seen on nesting site, 2010 (photo). Painted, Blanding's and Snapping Turtles regularly seen in pond where landowner and LPBLT have made improvements.
Turtle Nesting Site (x2)	21	Potential use/confirmed occurrence: Blanding's Turtle, Snapping Turtle, Midland Painted Turtles.
Turtle Nesting Site (x2)	30	Potential use/confirmed occurrence: Blanding's Turtle.
Turtle Nesting Site (x2)	31	Potential use/confirmed occurrence: Midland Painted Turtle.

The evaluator asked project staff about the challenges associated with monitoring habitat enhancement sites. In their opinion, the effect of not being able to monitor the nesting structures and hibernacula as much as they would like tends in the direction of underestimating the use of habitats by turtles and snakes – thereby, understating project success. Additional monitoring, particularly during critical periods of the year, would likely increase the amount of evidence of success, as would increased participation in monitoring by volunteers and landowners. The use of cover boards, which provide search locations, near snake habitats is an additional way to increase likelihood of positive searches. Project staff monitor sites throughout the active reptile season, but since sites are geographically distant from one another and resources are limited, there are logistical constraints. LPBLT has placed increased emphasis on monitoring these sites with the help of landowners and volunteers, and increasing the monitoring of constructed habitats is a priority of LPBLT for future years (dependent on funding). LPBLT is also experimenting with snake nest box examinations, the use of remote cameras, plumbing “scopes” (which can be used to see inside underground spaces) and other techniques to increase further the likelihood of positive searches. LPBLT has also begun deploying temperature probes in its constructed habitats to monitor winter temperatures in hibernacula and summer temperatures in nesting structures.

One aspect which should not be overlooked is the fact that the habitat enhancement strategy is having a beneficial effect on the landowner participants themselves, as discussed in Section 5. The strategy is an effective tool for engagement that is meaningful and personal. It cultivates a sense of ownership and responsibility. Some participants expressed pride not only in what s/he is doing for reptiles, but in the spin-off effect their actions may be having on others, as suggested by this comment from a landowner with a snake nesting box:

*People see the box and ask me, "What is that?" I explain it's a snake nest box and they say, "Oh really!"* (landowner and project participant)

On the whole, the answer to the question of whether the habitat enhancement activities resulted in use by reptiles is "yes," based on fairly limited reports. As to the question of whether there is evidence of enhanced use or survival based on design, the answer is that while there is no known experimentally-designed study attempting to answer this question, project staff continue to work with contractors and landowners and to consult with other practitioners in efforts to improve design with that in mind.

Given the inherent difficulties and time required to monitor the constructed reptile habitats (and other habitat enhancements), LPBLT's plans to further enhance monitoring is an appropriate response. The enthusiasm with which host landowners and contractors are approaching the enhancement on their properties suggests that these people likely would be interested in assisting with efforts to find solutions to the challenges of monitoring. The contractors who were interviewed are highly motivated and keenly interested in questions surrounding effects of habitat enhancements on reptile use and survival.



Enthusiastic cooperation from landowners is central to the project's success; rescued hatchling Snapping Turtle. Photos: Gregor Beck

### 4.3 Outreach, Awareness and Education

This section reports on results of the participant survey and the analysis of information materials.

#### 4.3.1 Results of the participant survey

Of the original 20 names that staff had provided to the evaluator, only one individual could not be reached, the reason being extended travel overseas. All other individuals were reached and agreed to the interview. The staff then added an additional name to the list. The evaluator successfully reached and interviewed that person, which brought the total number of interviewees to 20. The interviewees were equally divided according to gender: ten men; ten women.

The majority of interviewees were reached on the first attempt. All agreed to be interviewed. Interviews lasted an average of 12.2 minutes, ranging from six to 20 minutes in length.

Figure 1 groups interviewees according to six categories of involvement with the project. All had participated in two or more categories and demonstrated considerable familiarity with project objectives, services, information materials and staff. As a target audience group, they could be described as "very engaged" project participants. The category involving the highest number of interviewees (19 out of 20) was reptile reporter, i.e. a person who reports observations of reptiles to project staff via telephone, or website or other means. The next highest category was individuals who had experienced a site visit to their property by project staff (18 out of 20; the other 2 did not possess land suitable for enhancement). Fourteen had constructed reptile habitat(s) on their property (Table 7). Note, many individuals took part in multiple project activities.

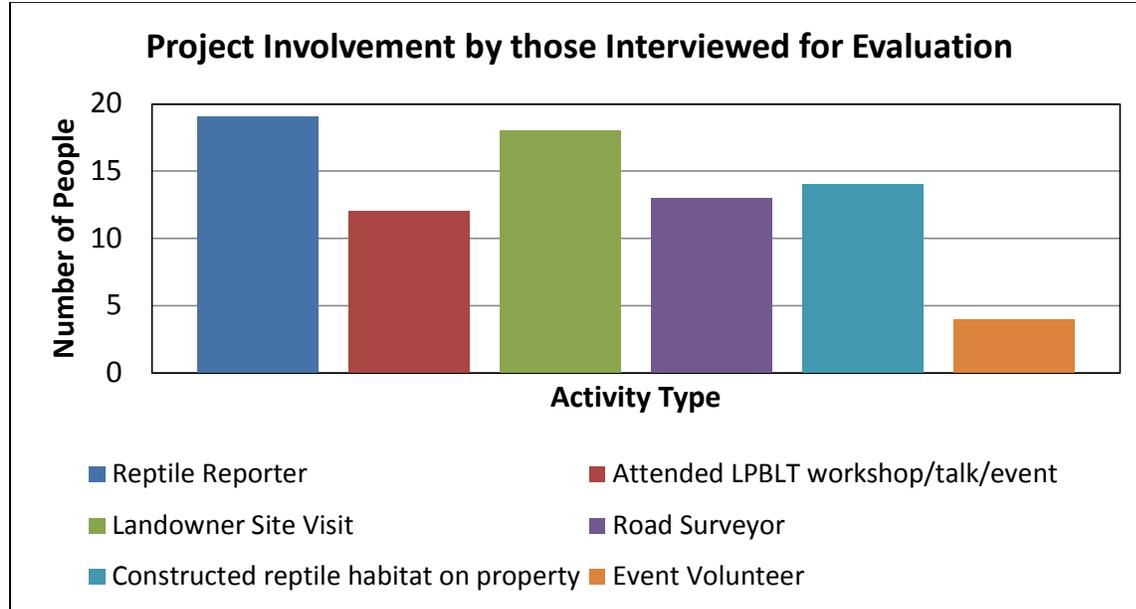
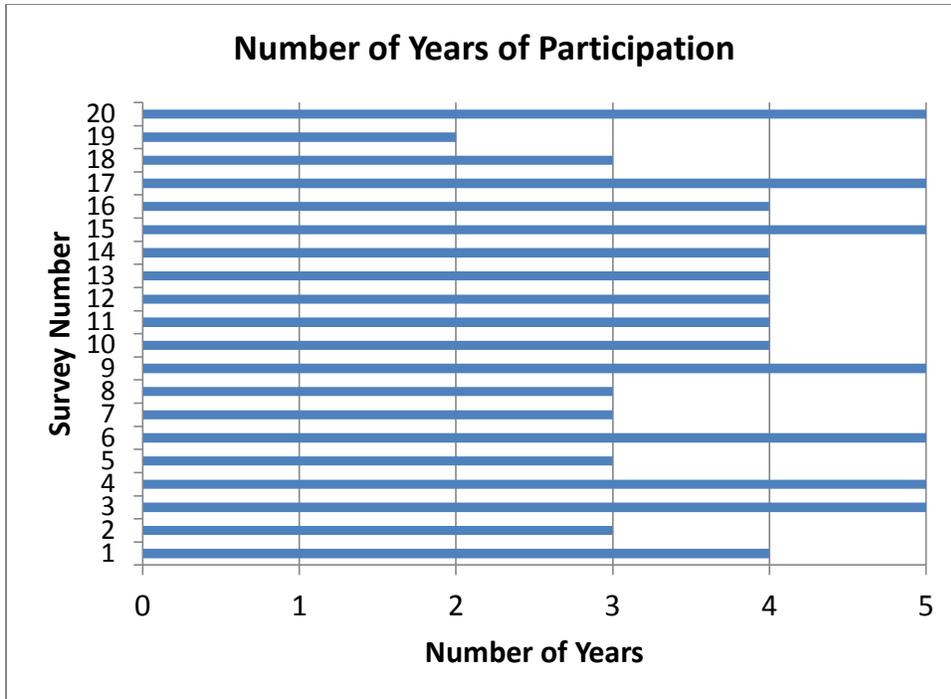


Figure 1. Proportion of interviewees who were involved in each of six categories of project activity.

The majority of individuals interviewed participated in the project during the period 2010-2013. All interviewees had participated in project activities for two or more years (Figure 2). Seven individuals had been involved in the project for all five years. Only one person had participated less than three years

and this person's involvement was cut short when her employer re-assigned her to another region. The average length of involvement among the 20 participants surveyed was 3.9 years. Although the retention rate (engagement in successive years after onset of involvement) was not calculated, quick inspection of the data revealed it to be high.



**Figure 2. Number of years of project participation by 20 individuals interviewed.**

Table 7 lists the categories of constructed reptile habitat on property owned by interviewees and the number of these individuals who serve as owner/steward of the constructed habitat. All but two of the interviewees were stewards of at least one constructed reptile habitat (the others did not own appropriate habitat). The types of habitat enhancements which constituted "other habitat enhancement" included installation or enhancement of a pond or other small wetland and thinning of pine plantations. Minor alterations included building brush piles, creating sunning areas and placing a log in a pond. The most common type of constructed reptile habitat on properties owned by interviewees was snake nesting habitat.

**Table 7. Number of interviewees hosting constructed reptile habitat, by habitat type.**

Types of Constructed Reptile Habitat on Interviewee Properties	Number of Individuals with Constructed Reptile Habitat
Turtle nesting habitat	4
Turtle pond enhancement	4
Snake hibernaculum, with basking area	4
Snake nesting habitat	12
Other habitat enhancement	8

The most compelling information that emerged from the participant survey concerned changes in knowledge, attitudes and behaviour as a result of participating in the project. Table 8 presents the

results from six questions posed to interviewees concerning their knowledge, attitudes and actions toward reptiles as a result of participating in the project.

**Table 8. Percent response to questions about changes in knowledge, attitudes and behaviour toward reptiles as a result of participation in the project.**

	Increased	Decreased	Stayed the Same
<b>Knowledge</b>			
Knowledge of Species and Habitats at Risk	100%	0%	0%
Ability to Identify Reptiles	85%	0%	15%
<b>Attitudes and Motivation</b>			
Willingness to Help Reptiles	70%	0%	30%
Comfort toward Reptiles	40%	0%	60%
<b>Actions</b>			
Personal Actions that Benefit Reptiles	75%	0%	25%
Actions that Benefit Other Species or Native Biodiversity	75%	0%	25%

All 20 interviewees, or 100%, stated that their knowledge of species and habitats at risk had increased as a result of the project. Many interviewees offered comments about the extensive knowledge they had gained from project staff.

*By talking to Gregor and Adam, we became more knowledgeable of what needs to get done. I've always been interested in reptiles and thought I knew a lot. (landowner and participant)*



Project Director, Gregor Beck, with Eastern Foxsnake (on loan from Scienstational Sssnakes!!) at reptile conservation workshop. Discovering a DeKay's Brownsnake at Autumn Eco-Fest Event, fall 2013. Photos: Kevin Kavanagh (L) and Gregor Beck (R).

Eighty-five percent of interviewees stated that their ability to identify reptiles had increased. More comments about the type of specific knowledge that had been gained referred to snakes rather than turtles, likely owing to the larger number of species and greater challenge of correct identifications. Some individuals spoke enthusiastically about their improved ability to identify local snakes.

*I even have a neighbor who runs up to me and says, "What's this?" I'm known as the snake lady.*  
(landowner/participant)

Seventy percent of interviewees stated that their willingness to help reptiles had increased. Some of this is undoubtedly linked to participant satisfaction in seeing positive results from their own actions to benefit reptiles.

*I think how small changes in attitude and habitat can make a big difference, e.g., eight years ago when we came I did not see any snakes. This past year I had a snake lay eggs in a sandy area.*  
(landowner/participant)

Although it was not a specific objective of the project to reduce people's fear of snakes and other reptiles, 40% of interviewees stated that their comfort level had increased as a result of participating in the project.

*Now they don't bother me at all. Amazing!* (landowner/participant)

*I hated snakes when I was a kid. Probably because I was afraid of them. Now I know there's nothing to be afraid of. They are not terrible creatures. Some people think they are. We were taught that as kids.* (contractor/participant)

Behaviour change is often considered a more powerful indicator than changes in knowledge or attitudes, partly because it may be viewed as having more tangible and measurable impact on the species or habitat. Without a baseline of data from which to compare responses, the survey focussed on measuring interviewees' perspectives of whether and how their behaviour had changed as a result of the project. Seventy-five percent of interviewees stated that their personal actions that benefit reptiles had increased; moreover, 75% stated that their actions to benefit other species at risk and biodiversity in general had increased.

Knowledge change, also, is important, especially when the public may have little knowledge of the species or how their own actions may be impacting the species negatively. The public needs to understand the rationale for conservation and recovery. Also, unless the knowledge conveyed is of interest to the public, it may have little influence in cultivating more positive attitudes and a desire to want to protect species. Table 9 lists the number of interviewees who stated that their knowledge had increased relative to specific topics about reptile conservation.

**Table 9. Number of interviewees who responded that their knowledge about reptiles had increased, by topic.**

Topic	Knowledge of Specific Topics About Reptiles Increased
Threats	20
Habitat needs	20
What you can do to help reptiles	19
Biology/life cycle	17
Other topics	7

An abundance of research over the past few decades has focused on attempting to identify the precise influences that lead to positive environmental behaviours. Needless to say, there are many influencing

factors. Without attempting to identify the cause of peoples' change in actions, the questionnaire administered to participants probed the timing of specific behavioural changes relevant to reptile conservation, i.e. whether the onset of that change occurred before or after a person's participation in the project. Interviewees were presented with six types of actions which were considered beneficial to reptiles. They were asked, "Which of the following actions had you been doing all along, and which ones did you *initiate or increase as a result of* the project?" Interviewees were allowed to respond positively to both time periods if they felt their actions took place before the project, but were also increased as a result of the project. In so doing, it was possible to obtain total scores of more than 20 for any one category of action.

Table 10 presents the number of interviewees who responded yes to having taken certain actions that benefit reptiles either before the project began or as a result of participating in the project. A few interviewees responded to both time periods concerning the categories "being more watchful for wildlife" and "enhancing reptile habitat."

**Table 10. Number of interviewees stating their behaviour had changed with respect to six categories of behaviour beneficial to reptiles, either before the project or as a result of the project.**

Action	Before Project	Initiated or Increased as a Result of Project
Being more watchful for wildlife*	8	14
Reporting wildlife to monitoring programs	1	19
Helping wildlife get off the roads	10	10
Enhancing reptile habitat*	4	18
Driving slower	9	11
Spreading the word about reptiles/conservation/species at risk stewardship	2	18

\*A few interviewees responded to both time periods.

It is one thing to attract and engage volunteers in the work of conservation and it is another to keep them engaged from year to year. One way to do so is to appeal to their interests. In an open-ended format, interviewees were asked to identify what has interested them most about the project. The responses, by category, are listed in Table 11. There was an equal number of responses referring to each of three categories: outreach/awareness/education; surveys/monitoring; and habitat enhancement. In general, the responses indicate a common interest in learning more about the species, habitats and ecological communities of the area. They also suggest that people enjoy seeing the merits of their actions in benefiting local wildlife. Just as revealing is the absence of comments about restrictions, regulations and enforcement – themes which dominate many conservation initiatives (and the public media), particularly for species at risk.

**Table 11. Responses of interviewees, by category, to the question, "What has interested you most about this project?"**

<b>Outreach/awareness/education</b>
Just learning. Broadening my knowledge.
My awareness of everything. I share it with kids.
I don't know. All of it.
Learning about the Blanding's Turtle. I had never really seen where they lay their eggs.
Just the chance to learn more about the natural community of the area and to share it. It's all been good

<b>Surveys/monitoring</b>
The reporting. I walk back-country roads. You see them squished.
Keeping an eye out for snakes. I'm not sure I looked as much before.
Finding out where [at the local level] different species are being seen.
Hearing about some of the rarer reptiles that other people have had on their properties.
The issue of the population of reptiles and the fact they are diminishing in this region, western Ontario.
<b>Habitat enhancement</b>
How quickly the "snake pit" [snake hibernaculum] was built. They brought in a back-hoe. It did no damage. A normal person would walk by and not know it was there [afterwards].
How vast the efforts are. Talk to Gregor and they're building a nest here and there. It takes tons of material to build them.
Most interested to get the snake nesting box.
Quite rewarding to construct something and see species come in.
The habitat. I didn't understand about that before.... Snakes are everywhere.

When asked if there were any suggestions they would like to make about the project, a few people commented on the fact that there are still many people in the region who do not share their same level of awareness and concern for reptiles. Those commenting would like the project to reach out to people such as these.

*It's a very worthwhile program and reaching out and getting more converts is the way to help.*  
(landowner/participant)

*Getting more publicity from the newspapers in the area to get the word farther out. I think there's still a lot of people who don't know about the situation with reptiles. You have to repeat and repeat.* (landowner/participant)

It is noteworthy that all interviewees expressed very positive opinions about the project and its staff, as illustrated in Table 12.

**Table 12. Additional comments from interviewees, which convey general praise for the Conserving Carolinian Reptiles project.**

Pat themselves on the back for a good job.
I think they do a wonderful job.
Just keep going, guys.
I think it's a <u>really good initiative</u> and I hope we're <u>going</u> to see a some snakes in the box. It's a great program.
I'm proud to be part of it. They respected anything I asked them to do. I like speaking to knowledgeable people.
I think it's a great project. I hope to see it keep growing. Hope more people become aware of things.

#### 4.3.2 Information materials, videos and general outreach

When they were not meeting with landowners, constructing habitat enhancements, conducting surveys, or managing the project fundraising and operating budget, the project staff were often reaching out to

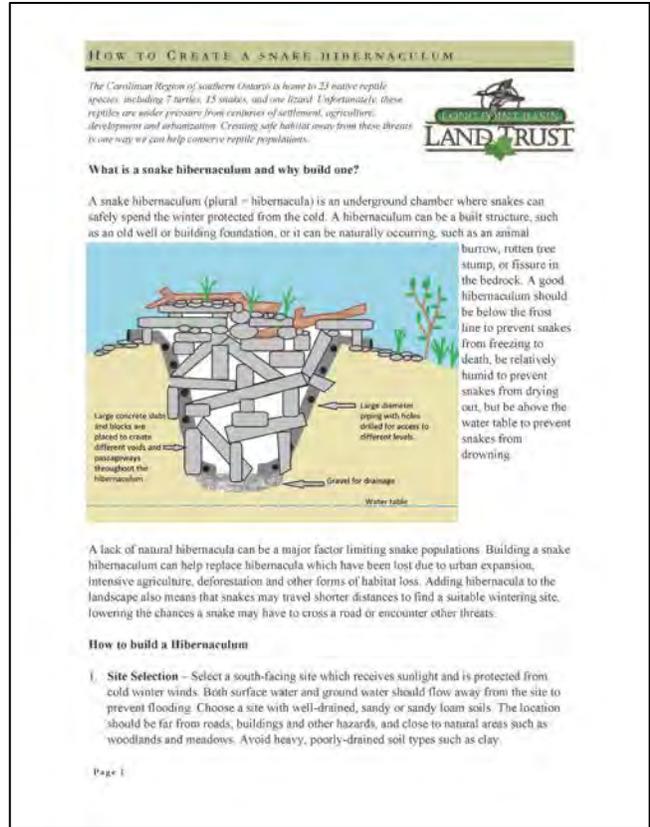
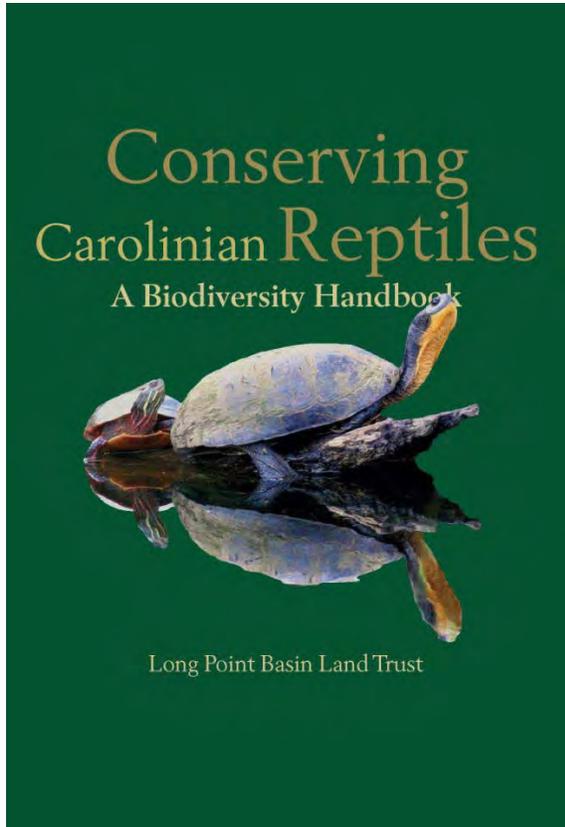
the general public with a variety of information materials and presentations. Over the five-year period the project produced numerous informational factsheets and handbooks, participated in the production of instructional videos and gave about two dozen presentations or workshops to local naturalist, horticultural and other groups, schools and public events. Table 13 lists the print publications that staff produced during the five years.

**Table 13. Publications by Long Point Basin Land Trust.**

Type	Title
Biodiversity Handbooks	Conserving Carolinian Reptiles
	Gardening with Native Plants
Helping Nature Pamphlet	Helping Wildlife at Home
Reptile Factsheets	Tips for gardeners to help reptiles
	How to create a snake hibernaculum
	How to create a snake nesting structure
	Creating and improving turtle habitat
	Long Point Provincial Park reptile barrier factsheet
	Long Point Basin turtle identification factsheet
	Long Point Basin snake identification factsheet
Newsletters and articles	Annual LPBLT newsletter, with project profiles
	Numerous articles in other groups' publications



Volunteers and landowner participants at LPBLT workshop; snakes courtesy, Sciansational Sssnakes!! Photo: Gregor Beck



**Figure 3. Two examples of LPBLT publications and factsheets promoting reptile conservation: a booklet describing reptiles of the region and a fact sheet on how to build a snake hibernaculum.**

Table 14 lists the instructional videos.

**Table 14. Videos produced in collaboration with staff of the Long Point Basin Land Trust.**

Series	Video Title
Helping Reptiles Series	Pile it on for snakes
	Keep an eye out for reptiles
	Build a simple snake nesting box
	Make your pond turtle friendly
How the Land Trust Helps Endangered Reptiles	Building a hibernaculum (over-wintering site for snakes)
	Reptile fencing at Long Point Provincial Park (courtesy, The Sticky Tongue Project)
	Celebrating success: how LPBLT and friends are helping reptiles in the Long Point Basin
Helping Other Wildlife	Helping endangered bats
	LPBLT Nature Reserves

Upon review of these publications, the evaluator believes they are factual, user-friendly and attractive publications which serve their purposes well. Although the evaluator was not able to conduct field work to gauge public reaction to these documents, several participants whom she interviewed commented about the information materials.

*I found the booklet was quite informative. (landowner/participant)*

*The Trust was great with factsheets. We could show our visitors. It opened peoples' eyes to the number of species and why we were doing the fencing. (staff member of Long Point Provincial Park)*

The evaluator concludes that, as a result of the project, the public in the Long Point Basin area is more knowledgeable, more supportive of recovery and conservation actions for reptiles, and more active in recovery and conservation.

#### **4.4 Surveys and Monitoring**

Table 15 presents the results of five years of reptile survey data coordinated through the project, with input from staff, conservation partners, reports to LPBLT's reptile reporting program and volunteer reptile observers. It is the largest known database assembled for reptiles in the Long Point Basin and as such it contributes to the knowledge base of information about the occurrence and distribution of reptile species in the Carolinian Region of Ontario. Data were collected by casual observers through LPBLT's reptile reporting program, cooperating landowners, constructed habitat monitors, volunteer road surveyors, conservation partners as well as extensive surveys by LPBLT staff. Surveys included a variety of methods, ranging from incidental observations to targeted area searches of inland, coastal and riparian habitats.

The database includes records for 19 species of reptiles: 11 species at risk (SAR); eight species not listed or assessed as species at risk; and, one of which is a non-native species. Of the 19 species, 11 are snakes: five SAR; six other. There are eight turtle species: six SAR; two non-SAR (one of which is non-native).

The use of citizen volunteers for contributing monitoring data about many groups of species has broadened in scope over the past two decades, now encompassing many taxonomic phyla and operating in many geographic regions of North America. Without such monitoring, biologists would never be able to adequately determine occurrences and ranges and the shifts due to habitat loss, climate change and other influences that impact biodiversity. Data gathered from volunteers have their limitations and the database coordinated by the Conserving Carolinian Reptiles project is no exception. Staff have been quick to point out potential limitations in parts of the database due to an inability to guard against imprecision which goes with any monitoring program. In particular, they have raised the following issues that occur from time to time with regard to their database, all issues which they are attempting to address, namely: risk of misidentification (particularly for Eastern Ribbonsnake, Gray Ratsnake, Eastern Foxsnake, Milksnake, Eastern Musk Turtle), temporal issues (few early records prior to project initiation in 2009) and special issues.

LPBLT remains confident that the database as a whole is reliably accurate and a generally illustrative representation of the diversity and relative abundance of species within the Long Point Basin. The database includes records from staff, professionals as well as casual observers which provides robustness as to observer confidence. In addition, LPBLT staff conduct follow-up with everyone who

submits records, usually within one to two days, seeking confirmations (often photos) for identifications. Data are reviewed by project staff, generally in collaboration with the observer, to confirm identifications. The increasingly ubiquitous presence of digital cameras (or cell phone cameras), together with the use of LPBLT or other resources materials, is proving immensely helpful for increasingly accurate reptile identifications.

**Table 15. Number of reptile reports by species, for the Long Point Basin, during 2009-2013.**

Species	2009	2010	2011	2012	2013	Average/yr.	Total
<b>Listed Species at Risk (SAR)</b>							
Blanding's Turtle (TH)	19	43	72	37	39	42	210
Eastern Foxsnake (EN)	21	36	47	25	80	41.8	209
Eastern Hog-nosed Snake (TH)	12	31	30	31	18	24.4	122
Eastern Ribbonsnake (SC)	2	6	9	5	0	4.4	22
Gray Ratsnake (EN)	5	6	7	4	3	5	25
Milksnake (SC)	10	15	40	14	9	17.6	88
Northern Map Turtle (SC)	73	126	75	346	245	173	865
Snapping Turtle (SC)	50	94	154	52	135	97	485
Spiny Softshell (TH)	1	6	1	2	4	2.8	14
Spotted Turtle (EN)	4	5	15	1	8	6.6	33
Eastern Musk Turtle (TH)	0	1	3	1	0	1	5
Species at Risk Totals	197	369	453	518	541	415.6	2,078
<b>Species not listed or assessed as Species at Risk</b>							
DeKays's Brownsnake	56	123	178	70	75	100.4	502
Eastern Gartersnake	147	181	237	125	190	176	880
Midland Painted Turtle	88	222	141	215	158	164.8	824
Northern Ring-necked Snake	0	1	1	0	0	0.4	2
Northern Watersnake	4	4	8	6	7	5.8	29
Red-bellied Snake	14	15	21	5	18	14.6	73
Smooth Greensnake	0	2	7	2	10	4.2	21
Non-SAR Totals	309	548	593	423	458	466.2	2,331
<b>Non-Native</b>							
Red-eared Slider	0	0	1	0	1	0.4	2
<b>Reptile Report Totals:</b>	<b>506</b>	<b>917</b>	<b>1,046</b>	<b>941</b>	<b>999</b>	<b>882</b>	<b>4,411</b>
<b># of reptile sighting contributors:</b>	<b>61</b>	<b>122<sup>1</sup></b>	<b>106<sup>2</sup></b>	<b>76<sup>3</sup></b>	<b>107<sup>4</sup></b>	<b>94</b>	<b>343<sup>5</sup></b>

<sup>1</sup> Contributors included approximately 9 LPPP staff.

<sup>2</sup> Contributors included approximately 15 LPPP staff.

<sup>3</sup> Contributors included approximately 15 LPPP staff.

<sup>4</sup> Does not include number of LPPP staff (presumed lower than prior years).

<sup>5</sup> Duplicates removed across all years.

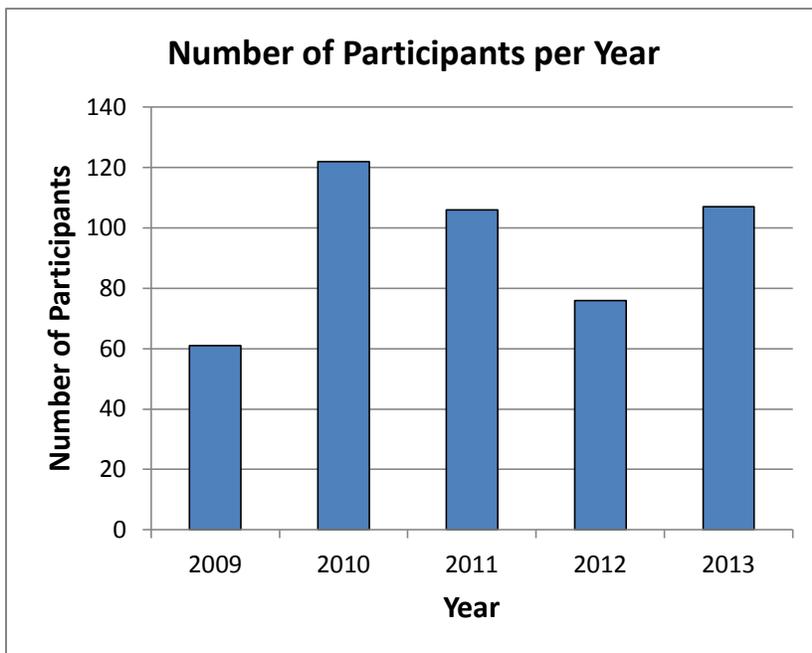
Note: a very few reports are from out of region, as noted in the master database

Note: EN – Endangered; TH – Threatened; SC – Special Concern

From 2009 to 2013, 343 individuals contributed 4,411 records of reptile observations – an impressive number for a largely rural region with a resident population of approximately c. 110,000 (estimated based on population of Norfolk County, plus half of both Haldimand and Elgin Counties, 2011). Factors that may be contributing to the high number of observers is the demographics (an abundance of retired people who own land and are interested in nature), the relatively high interest and literacy in environment, the high biodiversity, the amount of land in conservation ownership and the richness of conservation programs.

The highest year for reptile reports was 2011. Project staff provided two explanations for why they witnessed a peak in reporting during this year: 1) it was a "bumper year" for turtles and turtle hatchlings; and 2) the fencing installed at Long Point Provincial Park during 2011 led to a dramatic drop in observations (mostly, roadkill) during subsequent years.

The year 2011 was also the year in which the highest number of individuals contributed reptile reports. One factor contributing to this may have been the focus by Long Point Provincial Park staff on the problem of vehicle strikes along park roads. Several park staff were involved in gathering data in order to determine the best placement of the fencing. The numbers of staff may have dropped off in 2012 and 2013, which would have contributed to the drop in numbers of contributors for those years. Figure 4 illustrates the number of reptile sighting contributors to the Conserving Carolinian Reptiles project between 2009 and 2013.



**Figure 4. Number of reptile sighting contributors to the project, 2009-2013.**



Upper left: Monitoring road mortality in the Long Point Basin (Project Biologist Matt Timpf, 2010); upper right: conducting area searches for reptiles on a nature reserve (Species at Risk Biologist, Adam Timpf, 2011 ). Lower: Long-term volunteer and summer 2013 intern, Adam Lambert, with Eastern Foxsnake discovery. Photos: Gregor Beck

The reptile monitoring and reporting methods have undoubtedly contributed to the knowledge base for listed species of reptiles in the Long Point Basin area. This information has been of great importance to LPBLT and conservation partners in the planning and implementing of on-the-ground conservation actions over the course of the project. Observations have been used routinely by project staff to help prioritize future actions which benefit reptiles. For example, the initial report from volunteers (followed by monitoring by park, partners and LPBLT staff) led to the rapid installation of the successful reptile barrier fencing at Long Point Provincial Park. Similarly, reptile reports (notably, of road mortality) have helped LPBLT to identify areas for potential habitat creation which seek to create safe nesting and wintering habitats, thereby reducing mortality on roadways. In other examples, reptile reports have allowed LPBLT to work with other partners (e.g. Norfolk County) on road signage. The fact that LPBLT has collected a large database has also been helpful to larger monitoring efforts, especially a concurrent province-wide reptile and amphibian atlas project coordinated by Ontario Nature (with Ontario's Natural Heritage Information Centre). Similarly, the project has contributed important data to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and other bodies, providing important information on population assessments and the efficacy of various conservation approaches. While our knowledge about populations remains incomplete and challenging to acquire, the collective efforts are helping fill knowledge gaps – an ongoing challenge in the monitoring and recovery of species at risk.



Midland Painted Turtles basking. Photo: Gregor Beck

#### **4.5 Overall Evaluation**

Responses to four questions about the Conserving Carolinian Reptiles project appear below.

##### Is the project progressing towards its long-term goals?

As stated previously, the goals of the Conserving Carolinian Reptiles project are: 1) the recovery and conservation of reptile species at risk and their habitats within the Long Point Basin; and 2) the development of an informed, concerned citizenry which participates actively in recovery and conservation efforts. The results presented in section 3.0 demonstrate that, after five years of operation, the project has achieved all of its short-term outcomes and nearly all of its mid-term

outcomes. This report concludes that the project has made substantial progress toward the two long-term goals and that it shows promise of additional achievements as the project expands and matures.

#### How and to what degree is the public engaged?

Based on a sample of 20 highly engaged participants, the project has cultivated a keenly interested, concerned, and motivated portion of the public, comprising one of the most important target audience groups within the Long Point Basin. They demonstrate a strong willingness to continue their participation going forward, as a comment from one of the individuals who was interviewed demonstrates. Further, these individuals represent only a subset of the people engaged in the project. Over the five years, LPBLT has engaged the participation of hundreds of volunteer reptile reporters and scores of landowners. LPBLT also engages the public through diverse communications strategies, such as its practical videos, informative website and publications, hundreds of attendees at reptile workshops and presentations, as well as provision of technical support on reptile conservation and recovery to dozens of professional peers working in the field.

*I think it's a good project. I'm glad they carry on and it's good to be a part of it.*  
(landowner/participant)

*I'm proud to be part of it. They respected anything I asked them to do. I like speaking to knowledgeable people.* (landowner/participant)

This report recommends that the project staff strengthen the role of core volunteers as co-workers in recovery, while reaching out to new audiences who may not possess the same degree of awareness and concern.

#### Does the project demonstrate signs of sustainability?

Program sustainability is a function of many things. Among them are: solid and diversified base of financial and in-kind support, critical mass of engaged volunteers who will remain engaged from year to year, an adaptive management approach to program planning, a culture of learning that embraces evaluation for improved project delivery, institutional and community capacity, investment in youth, staff succession, and an ability of stakeholders to link the conservation initiative to community economic and social objectives. The project director is examining several of these aspects as he continues to plan the project for the years ahead. The land trust staff and directors, likewise, will need to examine these issues if they wish to see the project continue to grow stronger in the years to come.

Below are comments from two seasonal staff members who have worked for the project over several years:

*It's unique in that it's a small outfit, administratively, and what's it's doing.*

*...I think some things we've started will continue for decades after the project has gone, e.g., hibernacula...peoples' changes in being more careful. That example is also being transferred to kids. It's important because there's a huge population that doesn't accept reptiles.*

#### What weaknesses were reported or observed that might merit further attention?

The evaluation uncovered few weaknesses. It is more a case of finding areas that might benefit from further examination. Three areas for possible further investigation are described below.

1. *Monitoring the impact of the barrier fencing on a reduction in reptile vehicle strikes.* Accounts from project staff, former staff of Long Point Provincial Park and residents of the area testify to fewer reptile strikes by vehicles. An attempt to quantify the impact has been made by monitoring the subject area on Thanksgiving weekends – the period when the original mortality situation was documented as a baseline. This monitoring indicates a substantial reduction in mortality, complementing the more anecdotal observations during the balance of the park’s operating season. More effort could be given to gathering data throughout the operating season that would provide convincing evidence of the beneficial impact of the fencing and potential future improvements.

2. *Monitoring the reptile habitat enhancement structures that were constructed by the project, specifically, the snake nesting boxes, hibernacula and turtle nest sites.* What additional devices or strategies could be implemented that might help monitor their use or help monitor temperature and other critical factors that influence reptile survival? The enthusiasm with which the host landowners and the contractors are approaching the enhancements on their properties would suggest that these people would be interested in assisting with efforts to find solutions to the challenges of monitoring. The contractors who were interviewed are highly motivated and keenly interested in the questions surrounding the effect of the habitat enhancement structures on reptile use and survival.

3. *Reaching out to new audiences.* New audiences such as large scale farms can, by their operations, negatively impact reptiles and their habitat. Finding ways to work effectively with new audiences will require up-front research into the human dimensions, attempting to answer such questions as: 1) What barriers exist that might prevent them from becoming active participants in reptile recovery and conservation? 2) What misconceptions might they possess which can contribute to negative attitudes, particularly about snakes? 3) What benefits might conservation strategies bring to their businesses? and, 4) How might they be engaged in discussions aimed at finding solutions to human impact mitigation?



Spotted Turtle seeking nesting location. Photo: Gregor Beck

## 5.0 LESSONS LEARNED

The following are a few of the lessons learned from the analysis.

### Lesson 1. The power of on-site habitat enhancement for citizen engagement and empowerment.

One of the values of the constructed habitat enhancement is its power to engage and empower local landowners in the work of conservation and recovery. Regardless of any potential limitations, the snake nesting boxes, hibernacula and other habitat enhancements become a tangible tool for the cultivation of positive relationship between landowners and the living creatures on their property. Positive relationships that are up-close and personal is what stewardship is all about.

*Some of the farmers around here would just as soon destroy a snake if they were to see it. But we have a snake we call "Sebastian." (landowner and participant)*

Furthermore, there is great value in being able to see the results of small measures they can take to enhance the habitat for reptiles.

*Being able to see the change it makes, makes you want to do more. (landowner and participant)*

As people build confidence and knowledge about the reptiles they have on their properties, they want to share more of their knowledge and concern with their family, friends, and neighbours, as demonstrated by the following comments from landowners:

*I've got a neighbour who calls me. If I catch one [reptile], I show my grandchildren.*

*We're learning what the species need and you pass that on.*

The conservation impact of the habitat enhancement strategy of the Conserving Carolinian Reptiles project is difficult to measure, but its impact on strengthening public engagement cannot be disputed. Habitat enhancement on private lands makes conservation meaningful to people.

### Lesson 2. The influence of exceptional and knowledgeable individuals.

Successful conservation programs are dependent on the commitment and hard work of many individuals in a community or region. Oftentimes, the driving force behind a conservation initiative is that of one or two dedicated individuals. That is the case in the Conserving Carolinian Reptiles project, whose project director has been responsible for all aspects of the project since its inception. As some of the participants noted:

*This area is very fortunate to have people and groups like that. (landowner and participant)*

*It comes down to the Gregor Beck's of the world. He's an incredible addition around here.*

*I have to give them kudos because they are so passionate and engaged. A few people can make a difference.*

Stakeholder groups that interact with leaders of conservation initiatives like to see that the leaders are knowledgeable and respectful individuals. This is true no matter what the topic and the target audience groups. Project participants remarked about the knowledge and the respectful manner of project staff.

*You get more and more involved. Every time I talk to them I learn something more.*

It is also important that conservation leaders connect with the people on their level, to respond in a timely manner to observational reports and to questions from interested volunteers, and if possible to be located nearby. The following comments from participants describe ways in which they found project staff to be helpful.

*When we walked through the woods, and they explained what we could do to create, for instance, [reptile]sunning areas near a wood pile, they were very helpful.*  
(landowner/participant)

*Gregor and the Land Trust were great in helping me get up to speed and on learning about ways to help.* (former staff member of LPPP, who was new to the area)

With all the challenges that conservation organizations face, the governing board and senior management can sometimes lose sight of the fact that the dedicated project leaders whom they contract, as well as staff and volunteers, need support, encouragement and recognition.

### Lesson 3. The importance of keeping conservation projects positive and nature-based.

Too often conservation and recovery projects emphasize what people cannot do and where they cannot go – a strategy that can be off-putting, particularly if the conservation initiative is harmful to the local economy or negatively impacts people's livelihoods. Not so with the Conserving Carolinian Reptiles project, which appeals to the public's desire to learn more about the natural communities around them, especially around their homes and places of work.

Project staff have built a project culture that focuses on learning about and caring for some of the least understood species that are part of the local landscape. They have made the discovery interesting, fun and meaningful. They have produced many informative and interesting handbooks, factsheets and videos. They give presentations that are lively and entertaining where people can experience reptiles up-close and attempt to overcome their fears and inhibitions. Staff members are knowledgeable, respectful, and responsive to volunteers. On the whole, the messaging is enlightening and positive, and this has a lot to do with why the public wants to see this project continue.

Conservation projects in general will grow in strength and effectiveness when they take a positive approach.

## 6.0 CONCLUSIONS

The Conserving Carolinian Reptiles project, which has been in continuous operation since 2009, has made substantial progress towards each of its two long-term goals, and the project shows promise of additional future progress as the program matures.

The evaluation examined the project's four main strategies: 1) human impact mitigation; 2) habitat enhancement; 3) outreach, awareness, and education; and 4) surveys and monitoring. The evaluation found that the project had achieved each of its short-term outcomes and most of its mid-term outcomes for each of these strategies.

The project is an excellent case for using positive, nature-based messaging which appeals to citizens, particularly about snakes – a group of animals that many people have been taught to dislike or to fear. The habitat enhancement strategy is about empowering landowners to take positive actions that benefit reptiles on their own properties. It makes the conservation initiative meaningful and beneficial.

The evaluation found there exists a positive relationship of learning and respect between project staff members and participants who were interviewed. Property visits by staff help to empower landowners with actions they can take on their own to benefit reptiles, and many participants who were interviewed conveyed a sense of pride in what they were able to contribute and the new-found knowledge they had gained from the project. Knowing that the project staff are nearby and respond rapidly to their reports is a big support to the volunteers.

As more and more landowners want to participate, it may be necessary to examine more closely how best the few project biologists can provide the most effective scientific and advisory support to all landowners who wish to engage in habitat enhancement on their properties. The hiring of additional staff and an expanded mentoring relationship with staff members and volunteers might allow them to service an increasing number of volunteers as the project expands its reach, thereby allowing the director to focus on developing strategies for new target audiences such as owners of large scale farms and their employees and labourers.



Turkey Point Marsh, an important wetland complex for reptiles. Photo: Kevin Kavanagh

## 7.0 RECOMMENDATIONS

1. The Conserving Carolinian Reptiles project has made substantial progress towards its two goals and shows promise of additional achievement as the project expands and matures. This report therefore recommends that the Long Point Basin Land Trust and all relevant partners and funders give the project their strong support.
2. The project is making positive contributions to biodiversity conservation more generally through its effective multi-species, multi-faceted approach. It protects and enhances the habitats of not just reptiles but many other plants and animals. It builds a general conservation literacy among the public. It is recommended that the project be given the attention and support it deserves within broader initiatives in the region and province.
3. As monitoring appears to rely upon observational data of reptiles within or in proximity to these sites, a more deliberate protocol for monitoring could be developed in conjunction with the more interested and motivated landowners. With the help of additional funding, staff and the more motivated participants might investigate possible technological devices that would assist with monitoring the snake nesting boxes, hibernacula and turtle nests. In collaboration with partners such Long Point Provincial Park, and possibly others such as Long Point Bird Observatory, the project might dedicate more effort into tracking the effects of the fencing on human impact mitigation.
4. Landowners and other volunteers are gaining confidence in identifying and reporting their reptile observations, enhancing reptile habitat and mitigating human impacts where possible. The most engaged participants exhibit the commitment to pass on their knowledge to other people who may not share their level of awareness and concern. Their help is needed if the project is to reach out to new audience groups and a wider geographic region. A select number of volunteers could be trained for this purpose and designated as ambassadors for reptile conservation and recovery.
5. The evaluator was impressed by the perseverance, passion, and dedication of staff and volunteers associated with this project. Staff in particular give countless volunteer hours to the cause. It is recommended that as they are faced with the challenge of attracting and recruiting new volunteers, they also continue to examine ways to make their program sustainable and to train and mentor more staff to assume responsibilities that are currently handled by the project director.
6. The project is getting good press in the media and more is needed if the project is to grow in strength and influence. Recognition should be given to volunteers of different ages, background, and geographic region, who could be profiled in local media as well as websites and Facebook pages. This helps to build support in new geographic areas and untapped audience groups. It is anticipated that the faces of countless citizen scientists will also have a positive impact on conservation more generally.

## Appendix A. Conserving Carolinian Reptiles – Short Project Description

# Conserving Carolinian Reptiles Project

Long Point Basin Land Trust (LPBLT) is a charitable non-governmental organization which protects and restores natural habitats and biodiversity in the central Carolinian Region. The Land Trust owns five nature reserves, and promotes conservation through research, outreach and species at risk recovery. Since 2009, LPBLT has undertaken its Conserving Carolinian Reptiles project to help recover declining reptile populations. The project includes three major components: population surveys, including the volunteer reptile reporting program; construction and monitoring of diverse reptile habitats; and, extensive public outreach and support for landowners on species at risk recovery.

### Project highlights:

- LPBLT biologists and 350 volunteers have documented sightings of more than 4,400 reptiles, about half of which are species at risk, providing vital information to help turtles and snakes
- Construction of 60 reptile habitats, such as hibernacula (snake wintering dens), snake nesting boxes, turtle nest sites and larger-scale habitat enhancements
- LPBLT and Long Point Provincial Park have installed 750m of seasonal barrier fencing in the park, reducing road kill of reptiles in the area by about 80%
- Project staff and volunteers have rescued over 400 turtles and snakes from roadways, buildings and other hazards
- LPBLT has provided support and advice to hundreds of landowners, members of the public and conservation professionals about reptile recovery strategies
- Created factsheets, guides and videos about reptiles and conservation (please see LPBLT's website)



### How you can help:

- Report your reptile sightings to LPBLT (we're interested in recent as well as historic sightings!)
- Drive slower and more cautiously near natural areas, such as wetlands and woodlands
- Create a wetland for turtles, or add basking logs to existing ponds
- Create habitat in gardens or on the farm – wildlife loves rock piles, logs, leaf litter and native plants, water features
- Contact LPBLT to arrange a landowner outreach meeting to learn more about what you can do to help

**Please help** by reporting your reptile sightings online at: [www.LongPointLandTrust.ca](http://www.LongPointLandTrust.ca). These reports help identify priority potential locations for on-the-habitat and mitigate threats to areas for reptiles and identify ground actions that improve reptile turtles and snakes.



**Appendix B. Questionnaire Used for the Survey of Project Participants.**



**Conserving Carolinian Reptiles Project  
Landowner/project participant feedback survey**

Name:

Contact info:

Interviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

**Project involvement (check all that apply)**

- |   |   |
|---|---|
| <input type="checkbox"/> Reptile reporter (e.g. website, phone)   | <input type="checkbox"/> attended LPBLT workshop/ talk/ event |
| <input type="checkbox"/> Landowner site visit                     | <input type="checkbox"/> Road surveyor                        |
| <input type="checkbox"/> Constructed reptile habitat on property* | <input type="checkbox"/> Event volunteer                      |

**Project participant since (circle all that apply):**      2009    2010    2011    2012    2013

**What type of constructed reptile habitat do you have on your property?**

- |   |  |
|---|--|
| <input type="checkbox"/> Turtle nesting habitat   | <input type="checkbox"/> Turtle pond enhancement |
| <input type="checkbox"/> Snake hibernaculum, with basking area                                      | <input type="checkbox"/> Snake nesting habitat   |
| <input type="checkbox"/> Other habitat enhancement, e.g. thinning pine plantations; please specify: |  |

**Changes in knowledge, behaviours and/or attitudes**

**As a result of your participation in LPBLT's Conserving Carolinian Reptiles project:**

**Has your knowledge of species and habitats at risk:** \_\_\_\_\_ increased \_\_\_\_\_ decreased \_\_\_\_\_ stayed same?

Please explain:

**Has your ability to identify reptiles:** \_\_\_\_\_ increased \_\_\_\_\_ decreased \_\_\_\_\_ stayed same?

Notes:

**Has your knowledge of specific topics about reptiles increased? For example:**

\_\_\_ threats

\_\_\_ biology/life cycle

\_\_\_ habitat needs

\_\_\_ what you can do to help reptiles

\_\_\_ other topics, explain:

**As a result of the project, have your personal actions that benefit reptiles:**

\_\_\_\_\_ increased \_\_\_\_\_ decreased \_\_\_\_\_ stayed same? Notes:

**Which of the following actions had you been doing all along, and which ones did you *initiate or increase as a result of the project*?**

\_\_\_ being more watchful for wildlife; \_\_\_

\_\_\_ reporting wildlife to monitoring programs; \_\_\_

\_\_\_ helping wildlife get off the roads; \_\_\_

\_\_\_ enhancing reptile habitat (see list above); \_\_\_

\_\_\_ driving slower; \_\_\_

\_\_\_ spreading the word; \_\_\_

\_\_\_ other, specify: \_\_\_\_\_

Notes:

**As a result of your engagement with the project or talking with project staff, has your *willingness to help* reptiles:**

\_\_\_\_\_ increased \_\_\_\_\_ decreased \_\_\_\_\_ stayed same? Please explain:

**Has your *comfort level* toward reptiles:**

\_\_\_\_\_ increased \_\_\_\_\_ decreased \_\_\_\_\_ stayed same? Please explain:

**As a result of the project, have your personal actions that benefit *other species at risk* or native**

**biodiversity:**

\_\_\_\_\_ increased \_\_\_\_\_ decreased \_\_\_\_\_ stayed same? Notes:

**What has interested you *most* about this project?**

**If you would like to make any suggestions or say anything at all about the project, please do so.**

***Thank you very much! The LPBLT Conserving Carolinian Reptiles project staff and I appreciate your time.***



Conducting targeted area surveys, Norfolk County. Photo: Gregor Beck  
Immature Gray Ratsnake. Photo: Scott Gillingwater



# localnews

■ LONG POINT BASIN LAND TRUST



The small Spotted Turtle is one of the rarest turtles in our area – it would fit on your hand, more or less.



A snapping turtle hatchling, just after hatching, not much bigger than a toonie. The hatchlings of other smaller turtles can be the size of quarters or loonies – and are hard to see on roads. CONTRIBUTED PHOTO/GREGOR BECK

## It's totally turtle time again

With summer just around the corner and traffic volumes increasing steadily, southern Ontario residents are being urged to be extra watchful for turtles, snakes and other wildlife on roadways.

This is especially true in areas close to wetlands and woodlands where wildlife populations may be greater.

"Roads are one of the biggest hazards to turtles and snakes," said Gregor Beck, Director of Conservation Science with Long Point Basin Land Trust.

"Female turtles often venture across roads in late spring as they search for nesting sites and this obviously puts them directly in harm's way. Protecting adult females during the nesting season is one of the most effective ways to conserve turtles since the eggs they lay each year represent the population of the future."

The central Carolinian region is home to 19 species of turtles and snakes. Unfortunately, six of seven turtles and half of the area's downy snakes are listed as species at risk. Habitat loss, road kill, persecution and even the illegal collection of reptiles for the pet and restaurant trade are all factors leading to population declines. This time of year is hazardous not only for nesting female turtles, but also for snakes which are travelling to summering habitats and seeking mates.

Long Point Basin Land Trust offers the following tips to help reptiles:

- Watch for and avoid turtles, snakes and other wildlife on roads. Driving a bit slower near natural areas like wetlands and woodlands is a simple way to avoid collisions with wildlife.
- Report sightings of turtles and

snakes to LongPointLandTrust.ca. Reporting sightings helps the Land Trust learn more about reptile populations and plan conservation activities.

- Report suspicious activity or suspected wildlife poaching to authorities. Report suspected poaching to the Ministry of Natural Resources (TPS line: 1-877-847-7667 (1-877-NRPS-MNR)).

- Learn more about reptiles and species at risk. LPBLT has produced a series of new videos and fact sheets with practical tips and information about species at risk and reptiles. Check out the new videos ([www.LongPointLandTrust.ca](http://www.LongPointLandTrust.ca)) or visit LPBLT on Facebook ([www.facebook.com/lpblt](http://www.facebook.com/lpblt)).

Long Point Basin Land Trust (LPBLT) is a charitable non-governmental organization which protects and restores important natural habitats in the Carolinian region. LPBLT promotes conservation through outreach, research, habitat restoration and species at risk recovery. The Land Trust opens five nature preserves and works with landowners and conservation groups to steward natural areas.

This project was undertaken with the financial support of the Government of Canada through the Federal Department of the Environment, HMVA Environmental Fund, the John & Pat McCutcheon Charitable Foundation, and individuals and partners. Assistance for this project was provided by the Ontario Ministry of Natural Resources.



ABOVE: A typical nesting along a road shoulder, for a snapping turtle. It's a dangerous spot for the adults, and a dangerous spot for the young to hatch out. Raccoons and other predators have an easy time finding the nests when they're along a roadway. Most eggs hatch in 50-60 days, so there's a big emergence of young at the end of the summer. Sometimes, hatchlings will stay buried underground in the nest and emerge the next spring.



LEFT: A propellor injury on this Northern Map turtle seems to have healed. CONTRIBUTED PHOTOS/GREGOR BECK



Gregor Beck, conservation director with the Long Point Basin Land Trust, sits on his deck, which overlooks the Turkey Point Marsh near Long Point on Lake Erie.

## Land trusts protect remaining pockets of Ontario wilderness

Very little la

Valerie Hill, Record staff

LONG POINT, Ont. —

## Land trusts help to protect at-risk species

Monday, August 26, 2013 | WATERLOO REGION RECORD | News, A5

Basic continued from A1

Pel Bigelow, a member of the Kitchener-Waterloo Field Naturalists, looked into the issue for her environmental degree thesis in 2009.

"Basically there are no land trusts because no one has bothered to set one up," she said in an email, adding there is a small, private land trust in Brantford.

The field naturalists own two properties in the region that are not registered as land trusts. Neither is the Friends of Hidden Valley, a group fighting to protect an 80-hectare area home to a species at risk, the Jefferson salamander.

In 2011, the region's community environmental fund came into being, absorbing the former environmental stewardship fund. As well, a feasibility study on creating a land trust was launched and that initial report is due out in the next few months.

"The land trust movement has really taken flight," said Gregor Beck, conservation director for Long Point Basin Land Trust, a charitable organization that owns five properties. With every acquisition, a piece of paradise is either kept intact or, if previously developed, returned to its natural state.

"Land is expensive — \$5,000 an acre in Norfolk County," said Beck, a wildlife biologist and conservation specialist.

Beck has headed up the trust for six years, written management plans for the properties and speaks passionately about the movement that brings together citizens of all stripes who work together to raise money through fundraising, grants and private donations.

"Nature conservancies have purchased land for the last half-century but there was a groundswell in the last 25 years," he said, noting that interest must come from within communities.

Thes Silver, executive director of the umbrella organization Ontario Land Trust Alliance, said the movement has been strong in the U.S. and England for decades but only came to Ontario in the 1990s. Prior to that, the public assumed it was the government's responsibility and landowners wanting to donate property were hit with large capital gains tax.

Subsequent policy changes resulted in the ecological gifts program established in 1995 to provide major tax incentives for Canadians who either donate ecologically important properties or establish easements that protect the land. Because these lands are often on private property the program was seen as a powerful tool in saving flora and fauna.

"It's a big responsibility," said Silver of a land trust's obligations. It's not just about acquiring land, but also managing the area forever, which is why local involvement is so important.

Beck's home overlooks the spectacular Long Point wetland, a wilderness of two-metre cattails and, in the distance, the narrow arm of Long Point reaching into Lake Erie. Everything visible from his deck is privately owned by hunt camps, most dating back a century though Beck points out the owners are excellent stewards of the land.

"If they hadn't purchased and protected them, there is no doubt that the wetlands would have been drained, filled and/or otherwise developed," he said. As Beck scans the landscape, five sandhill cranes emerge from a



A young bald eagle flies past Gregor Beck's home near Turkey Point Marsh on Wednesday. Beck is the conservation director for the Long Point Basin Land Trust. Bald eagles have also nested in the Long Point basin trust's Jackson-Gunn Old Growth Forest Reserve.



A barrier constructed in collaboration with Long Point Provincial Park has reduced the number of reptiles killed by more than 75 per cent.



The Blanding's turtle is one of the threatened species that the Long Point Basin trust is helping to protect.



The brown thrasher is benefiting from the habitat created and protected by the Long Point Basin trust's Turkey Point Reserve.

hidden spot in the cattails, then a juvenile bald eagle drifts by. He points out a noise that sounds like the scree of a hawk, but, in fact is coming from a cheeky blue jay, a bird that loves to mimic other birds.

"That's why I have my office at the side of the house," he said, a place where there are fewer distractions, fewer reasons to dash outside to see what just flew by. Long Point, like so much of Ontario, still has these pockets of nature, spaces where trees, cold-water streams and rare creatures continue to exist. But not for long,

if the public doesn't step up and protect such areas.

The Hamilton Naturalists' Club, Beck says, was one of the first to create a land trust in Ontario. In May 1961, members were hiking through the beautiful Spooky Hollow near Turkey Point. When they learned the owner had just died, club members spontaneously decided to buy the place. By 2005, land trusts became a program at the Hamilton club, which now owns several such properties. Long Point Basin Trust's most recent acquisition is a 20-hectare site along Fisher's Creek, an area

that includes Carolinian woodlands and hundreds of metres of shoreline, a housing developer's dream. Purchasing this land, plus a Turkey Point wetland, what Beck calls "hot spots for biodiversity," was part of the group's \$1.1-million fundraising campaign.

"The biggest challenge for land trusts is juggling the funds to seize the moment when property comes available," he said, adding there is almost no support from government.

"Ducks Unlimited gave us a significant grant for Turkey

Point," he said. "The province has been a big contributor in the past." Trusts must look locally to maintain support.

"We are a feel-good, do-good group that's non-advocacy, non-confrontational," he said. Land trusts provide a platform for citizens to get involved, added Silver.

"You are part of a movement," she said.

"People are getting involved locally to do conservation. We've got to do it ourselves." w@w@record.com

# Simcoe Reformer



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**WE PUT LOCAL NEWS FIRST**

FRIDAY, OCTOBER 11, 2013

**ENVIRONMENT**

## Traffic a hazard for hatchling turtles

**SARAH DOKTOR**  
 Simcoe Reformer

Drivers in Simcoe are being reminded to watch out for baby turtles.

"We are right in the midst of turtle hatching season," explained Gregor Beck, director of conservation and science with the Long Point Basin Land Trust.

There are many hatchling turtles, about the size of a loonie or toonie, that are crossing roads as they try to find their way to a safe place in wetlands and woodlands. Turtle hatching happens throughout the fall, as well as some hatchlings emerge in the spring.

With their small size they go easily unnoticed.

"It is a really hard go for them," said Beck. "Drivers have to be very watchful of them."

Drivers are likely to see baby tur-

tles crossing the street for the next several weeks.

While turtles are typically found close to wetlands and woodlands, they can be found in other places.

"You could find a baby turtle just about anywhere," said Beck. It depends on how far the female turtle wandered looking for a place to lay her eggs.

They look for areas that have gravel or sand, which often brings them to the sides of roadways.

If you see a baby turtle on the road, you are encouraged to help it find its way safely if possible.

"Make sure you are parked safely and then get it off the road," said Beck. "Try to put the turtle in the direction they are headed!"

Baby turtles are usually easy to handle, but you should wash your hands after handling them, said Beck.

While helping a turtle

road may seem like a small action, if turtles make it past their first few weeks of life they can live for decades.

"Road hazard is huge," said Beck. "You've given them a huge boost. If you leave a baby turtle on a busy road, it's not going to make it."

Many native snakes are also finding their way onto roads as they travel to wintering areas or to soak up the warmth from the pavement, said Beck.

If residents see a turtle or snake, they are encouraged to report their sightings on [www.longpointlandtrust.ca](http://www.longpointlandtrust.ca).

"It helps us understand how the population is doing and identify problem spots," said Beck.

**Sarah Doktor**  
 319-028-8838 ext. 112  
[sarah.doktor@simcomedia.ca](mailto:sarah.doktor@simcomedia.ca)  
[twitter.com/sarahdokter](http://twitter.com/sarahdokter)



Traffic can be a major hazard for young turtles such as this baby

GREGOR BECK, Contributed photo

## Long Point's Turtles and Snakes Need a Hand... and a "Brake"

Conserving Carolinian Reptiles project gets by with a little help from its friends

By Gregor Beck  
 Long Point Basin Land Trust

With names like Foxsnake, Hog-nosed Snake, Musk Turtle and Spiny Softshell, visitors to the Long Point area might be left wondering what the region's wildlife are all about. The region is home to an incredible diversity of 12 snake and 7 turtle species – and the variety of names reflects the diversity of their habits, habitats and looks. While Long Point's dozen and a half reptile species are diverse in size, shape and biology, they have one thing in common: they need our help.



Hog-nosed Snake Photo by: Gregor Beck

Turtle and snake populations in the Long Point region and beyond are in serious decline, with six of seven turtles and half the dozen snake species now listed "at risk." The story is just as worrisome elsewhere in Ontario – and beyond. Habitat loss, habitat degradation, road kill, persecution and illegal poaching are common factors in the decline. Roads in particular are treacherous for both turtles and snakes. Many turtles leave wetlands and moist woodlands in search of nesting sites, too often putting them in the path of cars. Snakes travelling between different habitats frequently cross roads, and are also at risk because they will sometimes sun themselves (or "bask") on warm pavement.

Fortunately, there are lots of ways people can help reptiles. The simplest thing is to give them a "brake" by slowing down and avoiding turtles and snakes on the road. This is especially important close to favourite habitats such as wetlands and forests, including those inside Long Point



Fox Snakes Photo by: Gregor Beck

Provincial Park. Many snakes and turtles are small, so please drive carefully. And, if you see people harming reptiles or you witness suspicious activity, please report this to park officials or to the Ministry of Natural Resources Tips Line 1-877-TIPS-MNR.

Park visitors and the public can help even more by reporting observations of turtles and snakes to conservation groups. You can do this at the Park Office or by visiting The Long Point Basin Land Trust website: [www.longpointlandtrust.ca](http://www.longpointlandtrust.ca). Colourful identification factsheets, newsletters and other information on how to protect wildlife and restore habitats are available at both locations.

Public reptile reports are really important and help conservation groups to develop effective and local conservation solutions.

You can also learn more about the Conserving Carolinian Reptiles project, species at risk, habitat restoration, conservation and the Carolinian Region, as well as the Land Trust's nature reserve properties which are open to the public for walking and nature viewing, by visiting the



Spotted Turtle Photo by: Scott Gillingwater

walking and nature viewing, by visiting the website.

Follow Long Point Basin Land Trust on Twitter: @lpbt

Become a fan of Long Point Basin Land Trust on Facebook

### Turtles of the Long Point Basin and their conservation status:

- Spotted Turtle - **Endangered**
- Blanding's Turtle - **Threatened**
- Musk Turtle (or "Stinkpot") - **Threatened**
- Spiny Softshell Turtle - **Threatened**
- Northern Map Turtle - **Special concern**
- Snapping Turtle - **Special concern**
- Midland Painted Turtle - **Not at risk**

### Snakes of the Long Point Basin and their conservation status:

- Eastern Foxsnake - **Endangered**
- Gray Ratsnake - **Endangered**
- Eastern Hog-nosed Snake - **Threatened**
- Queensnake - **Threatened**
- Milksnake - **Special concern**
- Eastern Ribbonsnake - **Special concern**
- DeKay's Brownsnake - **Not at risk**
- Red-bellied Snake - **Not at risk**
- Northern Ring-necked Snake - **Not at risk**
- Eastern Garter Snake - **Not at risk**
- Northern Watersnake - **Not at risk**
- Smooth Greensnake - **Not at risk**



# Autumn Eco-Fest & Hawkwatch



Saturday, September 28 & Sunday, September 29, 2013

Join Long Point Basin Land Trust & Long Point Eco-Adventures for a fun open house weekend!

Come out and enjoy this great opportunity to visit Long Point Eco-Adventure's site overlooking Turkey Point Marsh and learn about species at risk and LPBLT's conservation work. LPBLT staff and volunteers will be on hand to lead walks and help scan the skies for migrating birds of prey. Plan on stopping by to visit the live snake and turtle displays and to learn about local reptiles, birds and other wildlife!

*Location: Long Point Eco-Adventures, 1730 Front Road, Norfolk, Ontario, 1km west of Turkey Point Rd  
(for more information or directions, please visit: [www.lpfun.ca](http://www.lpfun.ca) or [www.LongPointLandTrust.ca](http://www.LongPointLandTrust.ca))*



Daily Program (*FREE ADMISSION to these LPBLT events*):



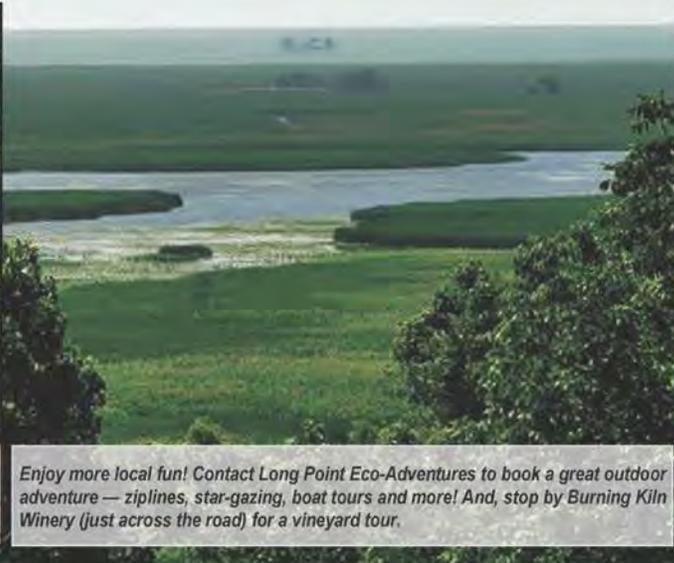
- 10:00am — 3:00pm Hawk-watching and bird identification for beginners
- 10:30am — 11:30am Guided wildlife walk (birds, reptiles, plants & more)
- 12:30pm — 1:00pm "Meet & mingle" with live snakes and turtles
- 2:00pm — 2:30pm "Meet & mingle" with live snakes and turtles

*Reptile educational exhibit presented in collaboration with:*



**Scienstational Sssnakes!!**

Conservation Through Education



*Enjoy more local fun! Contact Long Point Eco-Adventures to book a great outdoor adventure — ziplines, star-gazing, boat tours and more! And, stop by Burning Kiln Winery (just across the road) for a vineyard tour.*

**burning kiln winery**  
journey and destination, divine.